CACHEBOX TV

DURGESH KENI

COMPANY INFORMATION

- This is a British-based technology company founded in 2016.

- The company creation was followed by the grant of a UK patent.

- It uses [H.264 or MPEG-4 Part 10, Advanced Video Coding (MPEG-4 AVC)] with DVB S2 digital compression technology, transmitting using ST-2 satellite.

- The creation of Cache Box TV allows investors to invest in the overall development of the patent, licensing and also the eventual deployment.

- CacheBox TV has 11.86 million subscribers as of April 2017.

DURGESH KENI

Trading name	SafeCast
Type	Private Limited Company
Founded	2016
Patent No.	GB2498499 (22 May, 2016)
Headquarters	London, United Kingdom
Key people	Durgesh Keni (Founder)
Website	Safecast.co.uk

DURGESH KENI

WHAT IS DTH ?

- DTH is an acronym for 'Direct to Home' service.

- It is a digital satellite service that provides television viewing services directly to subscribers through satellite transmission.

- A dish is placed outside a home which helps in receiving the signals and broadcasting the transmission onto a television.

- The signals are digital by nature and are received directly from the satellite. The digital signals provide optimum quality in all features and make viewing an absolute pleasure.

- With DTH, you will also be able to view High Definition (HD) channels, more number of dth channels and you can customize the package as per your choices.

DURGESH KENI

VISION

- To reach pioneer amongst the DTH service provider across Western Europe and worldwide.

- To have a reliable, secure & highly available DTH network.

- To achieve a high revenue control globally.

- To provide Customer Satisfaction by providing smart services.

- To achieve operational excellence and become industry benchmark.

- Evolve and Improve by investing in future technologies.

DURGESH KENI

WESTERN EUROPE

United Kingdom

Ireland

Belgium

Netherlands

Germany

France

Switzerland

Spain

DURGESH KENI

BUSINESS STRATEGIES AND FUNDING

SWAATI SRINIVASAN

NAGA GNANISHA GUDURU

IDEA

MISSION

ENVIRONMENT ANALYSIS

BUSINESS ANALYSIS

RISK ANALYSIS

COST ISSUE

SWAATI SRINIVASAN

MISSION

- Provide High quality, integrated connectivity and content services to remote locations that maximize customer and company value.

- Maintain a permanent awareness of the obligation to satisfy our customer needs through Quality, Efficiency and Reliability.

- Creating value for our shareholders and interest groups.

- To promote territorial balance, social integration and development of our employees.

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BUSINESS STRATEGIES

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- Research on the competition and similar business.
- Features and benefits of choosing our satellite connection.
- Unique selling propositions.
- Setting a monthly goal for the company.
- Have valid money back offers.
- Involve recruiting students for internships and job shadow.
- Quality of Service.

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ENVIRONMENTAL ANALYSIS

EXTERNAL FACTORS

INTERNAL FACTORS

MICRO FACTORS

MACRO FACTORS

SWOT ANALYSIS

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EXTERNAL FACTORS

MICRO FACTORS

- Customers
- Employees
- Suppliers
- Competitors
- Investors
- Media
- Market

MACRO FACTORS

- Sociological factors
- Political factors
- Legal factors
- Technological factors
- Economical factors

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INTERNAL FACTORS

- The internal business environment includes factors within the organization that impact the approach and success of your operations.

- The internal factors of a business are often student in SWOT analysis.

- SWOT analysis is a process where the management team identifies the factors that affect the companies future performance.

- This is done as a part of the overall corporate planning process in which the financial and operational goals are set for the upcoming year and strategies are created to accomplish these goals.

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STRENGTHS

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- Enhanced TV viewing experience with cutting-edge technological advances.

- Multibeam antennas for a larger coverage and high capacity.

- Provides variety of choices from customers to choose their suitable connection.

- Leasing makes you more responsive to ever-changing market imperatives provided greater flexibility in terms of technology and finances.

- Leasing accelerates the effective tax-related life cycle, allowing us to keep the technology fresh.

- Ability to negotiate with suppliers.

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WEAKNESS

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Factors that are within your control and yet reduce your ability to maintain a competitive edge such as

- Lack of experience in the market.

- Market recognition in a short period of time would be difficult.

- Ability to change to customer needs promptly would be challenging.

- Ability to troubleshoot within a short frame of time would be tedious.

- Investors from different countries of Western Europe.

- Language barriers.

OPPORTUNITIES

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- Europe is the most developed nation which always has a lot of scope for establishment.

- The 2017 French Open tennis match held in France is great opportunity for us to sponsor.

- Perfect opportunity to connect all western Europe countries with one connection.

- With the ground set in Western Europe, expansion to all the other European countries is a possibility in the near future.

- By providing fast and secure connectivity we can offer services to government and educational facilities.

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THREATS

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- Competition from many established telecommunication companies.

- Conflicts among the board of directors.

- Equipment failure and maintenance.

- Failure to meet the rise in public demands.

- Growth in the use of IPTV.

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- There has been a gradual increase in the number of subscribers in the western Europe due to the increase in population and rising demands.

- This steady growth assures a steady increase in the rate of consumers for DTH services.

14 Jul 12

Pay-TV Subscribers: Satellite (DTH)
Western Europe

Source: Generator Research

Read source document and download this data in Excel:
www.generatorresearch.com/share/veiigcn

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RISK ANALYSIS

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What is risk analysis?

- Risk Analysis is a process that helps you identify and manage potential problems that could undermine key business initiatives or projects.

- Risk is made up of two parts: The probability of something going wrong, and the negative consequences if it does.

- Types of risk : Market risk, Technological risk , Financial risk, Operational risk etc.

What do we do after calculating the risk?

- Once the threats have been identified, we need to calculate the likelihood of these threats being realized and their possible impact

  Risk value = Probability of an event * Cost of an event

HOW IS IT DONE?

4. Reduce or eliminate risk.

1. Identify and m[...] critical assets.

Inventory

Treatment

Analysis

Evaluation

3. Determine risk threshold and need for remediation.

2. Determine and analyze risks.

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FUNDING

NAGA GNANISHA GUDURU

INVESTORS INVOLVED IN THE PROJECT:

- ❖ Bank loans

- ❖ Seed investors

- ❖ Government funding

- ❖ Sponsorships

NAGA GNANISHA GUDURU

BANK LOANS

❖ Include money borrowed from commercial banks.

❖ Loan is taken at an interest.

❖ The project has 25% of total investment(530.25 million) in bank loans.

❖ Loans taken from Bank of America, Capital One and Wells Fargo.

NAGA GNANISHA GUDURU

SEED INVESTORS

❖ An SEED investor is an affluent individual who provides capital for a business start-up usually in exchange for convertible debt or ownership equity.

❖ 20%(424.2 million) of the project funding is through seed investors

NAGA GNANISHA GUDURU

GOVERNMENT FUNDING

❖ This includes funding from the government where the project is being implemented.

❖ 30% (636.3 million) of the project funding is through government funding.

❖ UK- 220 million.

❖ FRANCE- 150 million.

❖ GERMANY- 200 MILLION.

❖ NETHERLANDS- 66.2 million

NAGA GNANISHA GUDURU

SPONSORSHIPS:

25%(530.25 million) of the project funding is through sponsorships.

INVESTMENTS IN THE PROJECT:

Sales

BANK LOANS   SEED INVESTORS   GOVERNMENT FUNDING   SPONSORSHIPS

NAGA GNANISHA GUDURU

LICENSING EXPENSES:

❖ The expense required by the company to pay in order to legally carry out it's operations.

❖ The licensing fee would be about 10 million for the project

NAGA GNANISHA GUDURU

SUBSCRIBERS AND COST IN EACH COUNTRY:

COUNTRIES	UK	IRELAND	BELGIUM	NETHERLANDS	SPAIN	GERMANY	FRANCE	SWITZERLAND
SUBSCRIBERS (IN MILLIONS)	65.14	4.64	11.29	16.94	46.56	81.41	66.81	8.287
COST	22	29	30	40	20	25	32	35

So the average cost can be taken as 26/subscription.

NAGA GNANISHA GUDURU

DEPARTMENTAL COSTS:

❖ BUSINESS STRATEGY AND FUNDING: 100 MILLION/YEAR

❖ BUSINESS PLAN AND SYSTEM PLANNING: 300 MILLION/YEAR

❖ ENGINEERING: 800 MILLION/YEAR

❖ OPERATIONS: 60 MILLION/YEAR

NAGA GNANISHA GUDURU

COSTS INVOLVED IN EACH DEPARTMENT:

- BUSINESS STRATEGY AND FUNDING:
  - RESEARCH AND DEVELOPMENT COSTS

- ENGINEERING COSTS:
  - SATELLITE LEASING COST
  - TRANSPONDER LEASING COSTS
  - GROUND CONTROL STATION COSTS
  - EQUIPMENT COSTS

- OPERATIONS COSTS:
  - MARKETING COSTS
  - MAINTENANCE AND CUSTOMER SERVICE COSTS
  - SALARIES FOR EMPLOYERS

NAGA GNANISHA GUDURU

BUSINESS PLAN & SYSTEM PLANNING

MANIKANDESHWAR MANOHAR

VINUTHNA SREEJA

LEAD-IN

- LICENSE NEED

- RESOLUTION CONSIDERATION

- CUSTOMER BASE & MARKET ANALYSIS

- COMPETITORS

- WHY WE SHALL THRIVE

- REVENUE GENERATED

WHY LICENSE?

Licenses are required for three main purposes:

• To identify your business and make sure you are accountable for your actions

• To protect the public health and safety

• To keep track of your finances for tax purposes

The pitfalls of not being properly licensed include:

• You cannot open your new location

• Your location may be padlocked

• You may be hit with costly penalties and interest, or even personal liens

TRANSMISSION RESOLUTION CONSIDERATION

A Broadcasters wishing to establish a satellite TV channel must first purchase capacity on one of the transponders which are basically satellite television channels that are subdivided into unique frequencies. Purchase price is based upon Megabits Per Second (Mbps) and generally, higher Mbps equates to better picture quality. A typical, standard definition channel has an average bandwidth of between 1.50 Mbps and 3.0 Mbps.

Display Resolution to be considered:
- Standard transmission
- 720p
- 1080p
- UHD-----temporary not possible

DVD 720	480
	720
720p 1280	
	1080
1080p 1920	
	2160
Ultra HD (4k) 3840	

TV HOUSEHOLD PRESENT -2020

The average percentage of increase in all the mentioned European Countries is estimated to be about 2%

MANIKANDESHWAR MANOHAR

DTH SUBSCRIBERS

Source: statistica

SUBSCRIBER CHURN

- The churn rate, also known as the rate of attrition, is the percentage of subscribers to a service who discontinue their subscriptions to that service within a given time period. For a company to expand its clientele, its growth rate, as measured by the number of new customers, must exceed its churn rate.

- On the first year we expect a subscription rate of 2% with a churn rate of 0.25% in the subsequent years.

DTH PENETRATION

- The Digital TV Europe Forecasts report (which covers 18 countries) states that Satellite TV penetration is expected to grow from 56.7% at end 2014 to 60.4% in 2020.

- In fact, the number of Satellite TV subscribers will climb by 2.57 million in 2015 to 99.00 million (up from 92.86 million in 2010) as Western Europe begins to shrug off the recession.

- Our Company is estimated to obtain 10% of the market share by the year 2024.

MANIKANDESHWAR MANOHAR

CHANNEL

- In our initial launch we are planning to host approximately 200 channels .But out transponders can hold a maximum of 250 channels.

- Average viewership of our channel is expected to make a deep impact on the total viewership in the selected countries.

SUBSCRIBER REVENUE

- Rather than selling products individually, a subscription sells periodic (monthly or yearly or seasonal) use or access to a product or service. In our case our satellite revenue can be generated on a monthly bases.

- The subscription average revenue for Europe in the selected countries is approximately 25 K

- By the year 2020 our DTH Service is expected to make about 10K

REVENUE IN YEAR

MANIKANDESHWAR MANOHAR

DTH TRANSPONDER LEASING REVENUE

DTH revenue contributes about 2.1 million per year per Transponder

Transponders leased for a duration of 3 years.

The number of channel can be later be allocated based on the requirement and the leasing can be renegotiated

We are planning to lease out about 6 of our transponders in the initial stage which accounts to a revenue of 12.6 million per year.

SUBSCRIBER ARPU

Average revenue per user (sometimes known as average revenue per unit), usually abbreviated to ARPU, is a measure used primarily by consumer communications and networking companies, defined as the total revenue divided by the number of subscribers.

Subscriber ARPU based on our revenue and number of subscription base by the end of 2018 is valued at £ 26.

COMPETITORS

Our Competitors include a vast established firms like:

- Sky TV

- Canal Digital

- Vlaanderen

COMPETITOR DETAILS

Parameters	Ours	Sky (Basic)	CanalDigital(Basic)	Vlaanderen(Basic)
Channel	200	312	170	100+
SD	380	301	48	70+
HD	65	11	18	21
Set-Up Cost	100	20	199	99
Contract length	6 Months(Can be extended without any cost)	18	12	24

MANIKANDESHWAR MANOHAR

Why HD?

- Since the launch of high definition in Europe in 2005, Eutelsat has been the industry innovator. The number of HD channels broadcast via our satellites has increased from 10 in 2006, to 1,000 in 2017.

- According to Screen Digest, more than 103 million homes in Europe are equipped with HD-Ready displays, making HD available in over 60% of households. Euroconsult forecasts that the share of HD channels in the worldwide satellite broadcasting market will increase from 5% in 2010 to 20% in 2020.

- This trend is accelerating in leading satellite television markets in Europe, including in Italy and Poland where the number of HD channels rose during the year by 70% and 30% respectively, reflecting the premium offers of anchor pay-TV platforms.

Manikandeshwar Manohar

The Stats!

- According to the statistics from Ofcom(UK's communication regulatory) Britons are shopping around more, signing long-term contracts in exchange for cheaper payments, and bundling services such as TV, phone and telephony.

- In the first quarter of 2009, 46 percent of consumers took a bundle with two or more services from one operator, such as pay TV groups BSkyB and Virgin Media, up from 39 percent a year earlier.

- More than 2 million households had access to a high definition service, according to the report, and 17.6 million HD-ready sets, in nearly 9 million households, have been sold in the UK.

ARPU

MANIKANDESHWAR MANOHAR

MARKETING STRATEGY

The small word with a big definition. Marketing is what makes a biz grow and flourish. Clients and sales are what make you a success. Some tools and tips to make our biz the best.

1. Our Unique Selling point:
USPs work a lot like logos. A USP shapes and reinforces your company's brand and identity.
It says what's different about you from all the rest.

Our USP :

A Safe Harbor For On Demand TV and Video

MARKETING STRATEGY

2. Offering a Variety of Bunded Packages

Offering a variety of bundled package is sure to attract a lot of customer base towards us. A-La-Carte channel package with cheap-price tag is also helpful for development of our DTV.

3.Social media

Social Media is a massive element of marketing if utilized in the right way. Means such as Facebook,Twitter are the main ways in order to market our product and to reach the masses with ease.

4.) E-Mail Marketing:

The recent trend shows that E-Mail marketing is an effective digital marketing tactic. It delivers the best Return of investment and it is the least difficult to execute.

5.)The old way - Posters & Pamplets:

Nothing beats the old method of marketing, through Posters and pamplets. The reach for these is tremendous and shall contribute greatly to the business development.

MANIKANDESHWAR MANOHAR

WHY WE SHALL THRIVE

- We are using the Ku band. Ku-band systems require smaller dishes because of their higher satellite transponder power and higher frequencies, which translates into smaller, cheaper antennas on the ground and therefore lower start up and transport costs.

- The smaller Ku-Band dishes can be easily installed on almost any surface- the ground, roofs or bolted to the side of buildings. This is an important consideration for areas with limited space.

- The number of channel offered is more than our competitors.

OVERALL REVENUE FROM SUBSCRIPTION

Our target is to reach 10% of the subscription base by 2024

At £26 / month by the end of the 1st year at 2% subscription (including churn rate) we get the total yearly subscription revenue to be
26*12* 1.73 = 539.76 + leasing of 6 transponders = 551.86 Million Approx

In 7 years at the same rate of growth expected in the number of TV satellite subscribers and by reaching our goal of 10% of the subscription base,the revenue of the 7th year accounts to:

26*12*11.856 = 3699.072 + leasing of 5 transponder(maximum)[5*12.8]
         =3763.072

SYSTEMS PLANNING

Vinuthna Korinni

VINUTHNA KORINNI

WORKING

Over land: It has a direct link to ground station for communication.

In air : Everywhere else, we have link via satellite, using L, Ka or Ku frequency bands.

SEGMENTS INVOLVED

> ➢ Ground segment

> ➢ Space segment

> ➢ Cabin segment

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WORK SEGMENTS

Systems engineering:

- Ground segment

- Space segment

- Aircraft/User segment

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GROUND SEGMENT

Earth station is a link that provides communication means a satellite.

Ground segment is a network of earth stations which provide a two way communication with satellite.

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GROUND SEGMENT COMPONENTS

- Gateway earth station

- Radio frequency equipment

- Baseband equipment

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GATEWAY EARTH STATION

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GATEWAY EARTH STATION

Ground stations may have either a fixed or itinerant position. Article 1 & III of the ITU Radio Regulations describes various types of stationary and mobile ground stations, and their interrelationships.

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Specialized *satellite earth stations* are used to telecommunicate with satellites—chiefly communications satellites. Other ground stations communicate with manned space stations or unmanned space probes. A ground station that primarily receives telemetry data, or that follows a satellite not in geostationary orbit, is called a *tracking station*.

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When a satellite is within a ground station's line of sight, the station is said to have a *view* of the satellite. It is possible for a satellite to communicate with more than one ground station at a time. A pair of ground stations are said to have a satellite in *mutual view* when the stations share simultaneous, unobstructed, line of sight contact with the satellite.

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WORKING OF GROUND SEGMENT

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GROUND NETWORK OPTIMIZATION

- Redundant ground infrastructure protecting from functional failures and fade events

- Hub diversity capability is another new feature implemented by iDirect for Inmarsat

- Sites designated Primary and Secondary Both sites receive all terminal traffic, in the event of fade event traffic handed over to alternate site

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MULTIPLE ACCESS TECHNIQUE

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MANAGING THE SERVICE

➢ The single network advantage

➢ Bandwidth allocation

➢ All instantaneous demand will be matched to provisioned Committed Information Rates (CIRs) for every priority level before any remaining bandwidth will be allocated to satisfy any provisioned Maximum Information Rates (MIRs) Load balancing

➢ Spreads terminal demand evenly over sets of overlapping beams. The network is aware of the locations of all the terminals, identifies those able to operate in more than one beam and can direct terminals to move beams in order to spread the traffic load more evenly

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SPACE SEGMENT

The **space segment** of an artificial satellite system is one of its three operational components (the others being the user and ground segments). It comprises the satellite or satellite constellation and the uplink and downlink satellite links.

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Satellite communications payload design must be properly coupled with the capabilities and interaction with the spacecraft bus that provides power, stability and environmental support to the payload. Satellite communications payload design must be properly coupled with the capabilities and interaction with the spacecraft bus that provides power, stability and environmental support to the payload.

WHAT IS A SATELLITE

- Satellite is a powerful long distance and point-to multipoint communication system .

- The function of the satellite is to communicate between different earth stations around the earth.

- The uplink frequencies are used for the transmission from the earth station to the satellite and the downlink frequencies are used for the transmissions from the satellite to the airplane.

- In the satellite the uplink frequencies are converted to lower frequencies with the help of the mixer and local oscillator.

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- The communication satellite acts as a repeater station ,it receives the signal amplifies it and then transmits it over to the next frequencies to avoid interference between the uplink and the downlink frequencies.

- A transponder can also be considered as a microwave relay channel that performs a function of frequency translation from the uplink frequency to the relative lower frequency.

- It comprises of a Input Multiplexer , TWT amplifier and the output Multiplexer.

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LINK BUDGET

Link analysis determines the properties
of satellite equipment.

Two links need to be planned

1.   Uplink- from ground to satellite
2.   Downlink - from satellite to ground

Two links are not in the same frequency.

Figure 2.3 Key elements and terms for the uplink and downlink.

R – range (meters)
A_e – free space path loss (dB)
A_{atm} – atmospheric absorption (dB)
L – line or waveguide loss (dB)
SFD – saturation flux density (dBW/m²)
G/T – gain to noise temperature ratio (dB/K)

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ELEMENTS OF THE SATELLITE LINK

Transmit Power
Transmit Antenna Gain
Path Losses - Free Space Loss - TX/RX antenna losses - Environmental losses
Rx antenna gain
Rx Properties(Noise Temperature , Sensitivity (S/N))

LOSSES

Additional losses include:

Misalignment of the antenna
Atmospheric losses
Random Losses

UPLINK BUDGET

- Output Power at Transmit Side (Pt): **100 W**
- Uplink Antenna Diameter: **5m**
- Antenna Gain (Gt)
- Path Loss (Lp)
- EIRP
- Waveguide loss at transmitter (Lt)
- Frequency:14.02GHz

• **Antenna Gain :** Determines the directivity of the antenna.

Gt = 10 log [0.68 x [(3.14 x D) / wavelength] ^ 2

Wavelength = c / f = 0.0212m

D = 5m

Hence Gt = 55.7dB

Free Space Path Loss : Loss in the strength of signal of electro magnetic wave

Lp = 10 log [(4 x 3.14 x R) / wavelength]^2

= 207.2 dB

- EIRP is the amount of power that a isotropic antenna would emit to achieve a maximum power density in the direction of maximum antenna gain. (Pt x Gt)
- The remaining parameters are also calculated and hence given us the total uplink C/N

Uplink frequency GHz	14.5
Uplink antenna diameter m	5
Uplink antenna aperture efficiency e.g. 0.65	0.65
Uplink antenna transmit gain dBi	55.73645
Uplink antenna, power at the feed W	1000
Uplink EIRP dBW	85.73645
Range (35778 - 41679) km	38500.0
Uplink path loss dB	207.3865
Uplink pfd at satellite dBW/m^2	-76.9730
Bandwidth Hz	26000000
Satellite uplink G/T dB/K	4
Uplink C/N dB	36.80015

DOWNLINK BUDGET

- Antenna Gain
- Antenna G/T
- Downlink Path Loss
- Carrier density ratio

DOWNLINK BUDGET

Downlink frequency GHz	12.5
Downlink receive antenna diameter m	0.6
Downlink receive antenna aperture efficiency e.g. 0.65	0.65
Downlink system noise temperature (antenna+LNA) K	55
Downlink receive antenna gain dBi	36.03092
Downlink receive antenna G/T dB/K	18.62729
Downlink satellite EIRP dBW	45
Downlink path loss dB	206.0974
Downlink C/N dB	11.98014

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TOTAL C/N

Uplink C/interference dB	28.0
Uplink C/N dB	36.80015
Satellite C/intermod dB	21.0
Downlink C/N dB	11.98014
Downlink C/interference dB	28.0
Total link C/N dB	11.26639

OUTLINE

- Team Objectives

- EutelSat Operator

- Satellite System Architecture and Interface Requirements

  o Components, properties and Services

- Transponders

- Consumer Equipment

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SYSTEM ENGINEERING OBJECTIVES

- To determine the desired bandwidth and power allocation

- To design uplink and downlink facilities

- To meet the capacity and coverage requirements provided by system planning

- Choosing satellite lease that meets the project specifications

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BASIC SATELLITE SYSTEM ARCHITECTURE - DELE

SATELLITE COMMUNICATION SYSTEM ARCHITECTURE- EDIT

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SATELLITE DESIGN, TYPES, & FREQUENCIES

- A satellite consists:
  o Spacecraft bus
  o Communications payload

- Two critical considerations in spacecraft design are:
  o Power and coverage

- A satellite contains multiple channels, called transponders, that provide bandwidth and power over designated radio frequencies

The satellite amplifies the incoming signal and changes the frequency **2**

The ground equipment transmits signal to the satellite **1**

Signal is transmitted back to Earth **3**

The ground equipment receives the signal **4**

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SATELLITE DESIGN

- The transponder's bandwidth and power dictate:
  - How much information can be transmitted through the transponder
  - How big the ground equipment must be to receive the signal
- In addition, the satellite's antennas direct the signal over a specific geographic area

The ground equipment transmits signal to the satellite **1**

2 The satellite amplifies the incoming signal and changes the frequency

3 Signal is transmitted back to Earth

The ground equipment receives the signal **4**

SATELLITE TYPES

Fixed Satellite Services (FSS)

Mobile Satellite Services (MSS)

Broadcast Satellite Services (BSS)

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SATELLITE FREQUENCIES

- Commercial satellite services primarily use three radio frequency bands:
  - C-band: provides lower transmission power over wide geographic areas and generally requires larger ground equipment for reception
  - Ku-band: offers higher transmission power over smaller geographic areas and can be received with smaller ground equipment
  - L-band: used for mobile applications, such as maritime and aeronautical communications, employing a variety of ground equipment

Satellite Components

- **Uplink Earth Stations:** The uplink facilities (content providers) are located in France, Italy and will be transmitting pre-packaged content up to the satellite.

- **Satellite**: The Geostationary satellite will be receiving the packaged content from the uplink stations and transmitting it to the numerous downlink earth stations within its coverage area.

- **Downlink Earth Stations**: The downlink facilities are located in metropolitan areas only. The stations will receive the packaged content from the satellite, add local T.V. content and transmit it to users via microwave towers.

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EUTELSAT

- French-based satellite provider

- World's three leading satellite operator in terms of revenue

- Provide services such as:

  - Broadcast and Media

  - Broadband

  - Data and Telecoms

  - Mobility

- The main craft have traditionally operated from four position

  - Each separated by three degrees at Geostationary orbit; 7, 10, 13 and 16°E

  - More positions are now operated

SHAIMAA ALKAABI

EUTELSAT

Eutelsat's fleet of 39 satellites covers:

Europe, Africa, the Middle East

Large parts of the Asian and American continents

EUTELSAT 3B
3° East

COVERAGE –
- Americas
- Asia
- Europe
- MENA
- Russia & CIS
- Sub-Saharan Africa

SERVICES OFFERED –
- Broadcast services
- Carrier networks
- Enterprise broadband
- Mobility

MORE INFO
EUTELSAT 3B

EUTELSAT 3B SPECIFICATIONS

Eutelsat 3B Frequency List	Frequency List Download / Print .INI Download	Tweet Share
Satellite Name	Eutelsat 3B	
Status	Active	
Mission Type	Communication	
Orbit	Geostationary	
Position	3.0 ° East	
Country	International	
Operator	Eutelsat Communications S.A.	
Satellite Manufacturer	European Aeronautic Defense and Space (EADS)	
Model (BUS)	Eurostar 3000	
Launch Vehicle	Zenit 3SL	
Launch Site	Sea Launch	
Launch Date	26.05.2014	
Satellite Lifetime	15 Year (Planned lifetime has 13 year expired.)	
Mass	5967 Kg	
Transponders	Ku Band Transponders : 30 C Band Transponders : 51	

SHAIMAA ALKAABI , SUSMITHA GANKIDI

CAPABILITIES OF EUTELSAT 3B

- Coverage: It mainly markets in Europe, Africa, Middle East , Central Asia, South America.
- Channels :
- High output power
- High availability
- High Reliability
- More flexibility is provided by the use of steerable antennas.

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EUTELSAT 3B COMPONENTS

- 31 meters solar arrays are deployed.

- 2 deployable solar arrays for power generation and associated batteries and avionics for power storage and distribution.

- Solar arrays deliver 12,000 watts of electrical power.

- A bi propellant propulsion system is required.

- 51 transponders covering Ku, Ka and C band frequencies.

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SPOT BEAMS OVER EUROPE

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Eutelsat footprint

Ku-band Europe (B, C, D, J, F) Uplink Coverage

Ku-band Europe Downlink Coverage

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SATELLITE PAYLOAD

Facilitates transmission and reception of radio signals to and from earth stations.

Transponders play a major role in the satellite payload.

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EUTELSAT Transponder

EUTELSAT 3B is a tri band satellite which offers satellite resources in Ku, C and Ka bands.

It was launched in May 2014 and replaced the EUTELSAT 3D satellite which has been co positioned with EUTELSAT 7A at 7 degrees.

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EUTELSAT TRANSPONDERS

⬜ Satellites contain multiple transponders for multiple area coverage.

⬜ A typical satellite bandwidth is generally divided into smaller bandwidths and are assigned to individual transponders.

⬜ 30 Ku-band transponders provide coverage to Europe and surrounding regions.

⬜ The Ku band capacity is primarily used for video, data and telecom services for government and commercial customers.

⬜ **Each transponder bandwidth is 36 MHz.**

⬜ **Transponder Input Noise Power: 500K**

⬜ **Output Power: 20W**

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SATELLITE COMPONENTS

- Input Band Pass Filter
- Input Low Noise Amplifier
- Frequency Translator
- Output Band Pass Filter
- High Power Amplifier

A TYPICAL PAYLOAD

Input filter · Mixer · Amplifier · Output Multiplexer · Receive antenna · Transmit antenna · Oscillator · Low-noise amplifier · Input demultiplexer · Amplifier ring

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Ku band

- Downlink :11.7 – 12.2 GHz

- Uplink: 14.0 -14.5 GHz

- **ADVANTAGES:**

- No interface from microwave links and other technologies.

- Operates with a smaller satellite dish (0.9m diameter). Cheaper installation

- **DISADVANTAGES:**

- More expensive capacity

- Sensitivity to heavy rain.

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UPLINK STATIONS (GROUND STATIONS)

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UPLINK STATIONS (GROUND STATION) cntd..

- Many signals are collected the the uplink earth station and are uplinked to the satellites by a group of large antennas with false margins sufficient to overcome any expected rain fade.
- The video and audio signals that have to be uplinked to the EUTELSAT 3B are available in pre recorded form on videotape or disc and are collected from other satellites and fiber optic lanes.
- Hundreds of disks and tapes are under computer control which supply audio and video signals for each channels.

EARTH STATION ANTENNAS

▶ One uplink antenna will typically transmit upto 16 RF channels.
▶ Each RF signal is QPSK modulated Ku band carrier.

FEED TYPES

▶ Focal Feed
▶ Cassegrain Feed
▶ Gregorian Feed
▶ Off Axis

The antenna efficiency of an Off Axis feed is 68 % and hence has a maximum gain

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ENCODER

- MPEG-2 encoding technique is used.

- It provides lossy video compression and lossy audio -data compression methods which permit storage and transmission of digital media.

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MODULATOR/DEMODULATOR

- Direct TV Broadcasts usually use phase modulations, and most preferably QPSK.

- It modulates the encrypted data (i.e channels) by QPSK modulation and transmits the signal to the satellite.

- Demodulator extracts the signal from the received IF signal from the down convertor and is decoded and decrypted.

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TWTA (TRAVELLING WAVE TUBE AMPLIFIER)

The encoded , compression and multiplexed bit stream drives a video exciter which generates QPSK modulation of an intermediate frequency carrier.

The HPA is usually rated at a much higher power than its normal operating power level, which provides sufficient output backoff of the HPA to ensure linear operation.

The signals from any number of HPAs are multiplexed together in microwave combiners and sent to the antenna feed for transmission to the satellite.

CUSTOMER END (CONSUMER

CONSUMER END

The Low Noise Block Convertor minimizes the loss of signal and hence maintains lowest possible system noise temperature.

The electronic polarizer is switched by changing the voltage supplied to the LNB via the cable which connects antenna and set top box receiver.

The entire downlink frequency is downconverted by LNB to 900 - 1400 MHz band.

DOWNLINK CONVERTOR

The downlink convertor consists of dielectric resonator local oscillator and a mixer, followed by an IF Amplifier and band -pass filter.

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SET TOP BOXES

The set top box accepts the entire 500MHz band and seperates other individual transponder frequencies.

The user enters a desired channel number into the set top box using an IR remote control.

The signal from the required transponder and then selected by the receiver.

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OPERATIONS

NAVANEETH ATLURI

DIVYA KARANAM

POINTS TO FOCUS ON

➢ Empathy, patience and Consistence.

➢ Adaptability.

➢ Clear Communication.

➢ Work ethic.

➢ Knowledge.

➢ Quality.

➢ Efficiency.

NAVANEETH ATLURI

CUSTOMER FEEDBACK

NAVANEETH ATLURI

QUALITY OF SERVICE

➢ Quality is the standard of something as measured against other things of a similar kind or the degree of excellence of something.

➢ It can also be considered as service's and product's fitness for its intended use.

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DIMENSIONS OF QUALITY OF SERVICE

NAVANEETH ATLURI

➢ The five Quality dimensions are: TANGIBLES-Appearance of physical facilities, Equipment, Personnel, and Communication materials. RELIABILITY-Ability to perform the promised service dependably and accurately. RESPONSIVENESS - Willingness to help customers and provide prompt service.

NAVANEETH ATLURI

ADVANTAGES OF QUALITY OF SERVICE

➢ Gives Administrators control over network resources and allows them to manage the network from a business, rather than a technical, perspective.

➢ Ensures that time-sensitive and mission-critical applications have the resources they require, while allowing applications access to the network.

➢ Improves user experience.

➢ Reduces costs by using existing resources efficiency, there by delaying or reducing the need for expansion or upgrades.

NAVANEETH ATLURI

PRODUCTION MAINTENANCE

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PRODUCTION MAINTENANCE

Production maintenance consists of

- ➢ Standard Operation Procedure (SOP).
- ➢ Maintenance.
- ➢ Spare Parts.
- ➢ Catastrophic Failure Plans.
- ➢ Post Mortem Evaluations.

Standard Operating Procedure (SOP)

NAVANEETH ATLURI

- ➢ Importance of SOP's:
  - ➢ Maintain routines.
  - ➢ Quality Control.
  - ➢ Performance management.
  - ➢ Replication and growth.

- ➢ SOP will be created for:
  - ➢ Daily Operations.
  - ➢ Maintenance.
  - ➢ Troubleshooting.

NAVANEETH ATLURI

SOP

➢ A good SOP promotes to good behavior because it helps:

   ➢ This saves time and mistakes.

   ➢ This increases economic work procedure.

   ➢ It ensures consistent results.

   ➢ Motivates the work force.

   ➢ Supports quality goals.

NAVANEETH ATLURI

SOP

➢ SOP helps reduce bad output because otherwise

  ➢ It creates error and frustration.

  ➢ It increases training costs.

  ➢ It wastes time and money.

  ➢ It detracts from quality goals.

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

➢ **ISO** is the international standard that specifies requirements for a quality management system (QMS). Organizations use the standard to demonstrate the ability to consistently provide products and services that meet customer and regulatory requirements.

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NETWORK OPERATION CENTER

NAVANEETH ATLURI

NETWORK OPERATION CENTER-PURPOSE

- NOCs are implemented by business organizations, public utilities, universities, and government agencies that oversee complex networking environments that require high availability. NOC personnel are responsible for monitoring one or many networks for certain conditions that may require special attention to avoid degraded service. Organizations may operate more than one NOC, either to manage different networks or to provide geographic redundancy in the event of one site becoming unavailable.

- In addition to monitoring internal and external networks of related infrastructure, NOCs can monitor social networks to get a head-start on disruptive events.

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NOC- ENVIRONMENT

- **Computer environments** can range in size from one to millions of servers.

- In **telecommunication environments**, NOCs are responsible for monitoring power failures, communication line alarms (such as bit errors, framing errors, line coding errors, and circuits down) and other performance issues that may affect the network, and in telecom sector have to track details about the call flow.

NOC - ENVIRONMENT

- **Satellite network** environments process large amounts of voice and video data, in addition to intelligence, surveillance and reconnaissance information. Example organizations that manage this form of NOC includes Artel, a service provider of commercial satellite bandwidth to the United States Department of Defense, located in Herndon, Virginia.

NOC- DESIGN

- NOCs are frequently laid out with several rows of desks, all facing a video wall, which typically shows details of highly significant alarms, ongoing incidents and general network performance; a corner of the wall is sometimes used for showing a news or weather TV channel, as this can keep the NOC technicians aware of current events which may affect the network or systems they are responsible for.

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NOC - DESIGN

- . The location housing a NOC may also contain many or all of the primary servers and other equipment essential to running the network, although it is not uncommon for a single NOC to monitor and control a number of geographically dispersed sites.

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NOC- PERSONNEL

- A NOC engineer has several duties in order to ensure the smooth running of the network. They deal with things such as DDoS Attacks, power outages, network failures, and routing black-holes. There are of course the basic roles, such as remote hands, support, configuration of hardware (such as firewalls and routers, purchased by a client). NOC engineers also have to ensure the core network is stable.

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WORKING WITH MAINTENANCE

➢ Installers will work with maintenance staff to train them on how to maintain and work on the system. Maintenance staff should be able to work on:

  ➢ Networking Issues

  ➢ Antenna Issues

  to resolve those issues as quickly as possible.

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Preventative maintenance schedule:

The following are performed to prevent from problems that might occur which might jeopardies the quality of the product.

Those are:

- ➢ Software Updates
- ➢ Firmware Updates
- ➢ Antenna Inspection
- ➢ Quality Tests

EXTRA THINGS WHICH ARE NEEDED

➢ For smooth functioning of this project, we need a list of spare parts which are critical for functioning and we need to be quick to replace.

➢ Some products need to be in hand which are hard to obtain.

➢ We also need a list of suppliers used for the project.

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REEMERGENCE PLAN

There might be a case for a failure of the project and there is a problem of losing our customers. So, we need to have a reemergence plan be it hardware failure, software failure or end of life for satellite.

We need to have means for short term lease so that we do not cause any interruption for our services provided.

We also need to have a emergency team so that it analyzes what went wrong and can help prevent the same mistake again.

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END OF PROJECT REVIEW

➢ After the project or its life span is complete, the team will revisit the project and come up with a review of the project or documents they have experienced to help the future teams.

➢ Lessons learned will include Project troubles, Problems, Ways to cut costs, Delays, Ways to mitigate Problems in future projects.

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OPERATIONS

Technical operations include :

- FUNCTIONING OF THE SATELLITE CONTROLLED NETWORK(SCN)

- NETWORK OPERATING CENTER(NOC)

- MANAGING THE GROUND STATIONS

- Geo Satellite

- Gateway Antenna.

SATELLITE CONTROL NETWORK

- As we are new to market, initially we are outsourcing SCN funtions to EUTELSAT satellite Control Center because of their expertise, experience and existance in western Europe.

- EUTELSAT is in Top Three leading companys in world for satellite operations and control.

- Contract cost is 550 Million Euros for 3 years, deals.

DIVYA KARANAM

SATELLITE CONTROLLED NETWORK(CONTD....)

EUTELSAT will be contracted to handle the following:

- Transfer orbit operations immediately after the satellite is launched.

- In-Orbit Testing (IOT) , performance and functional checks.

- In-Orbit Operations, 24/7 surveillance of satellite health.

- Monitor the satellite.

- Support during emergency situations.

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GATEWAY EARTH STATIONS

- For the start, we will take control of the earth stations & as the business grows we will outsource the Independently owned teleports.

- Gateways will provide connectivity to national & regional telecommunication networks.

- • The uplink stations will facilitate in monitoring system performance & availability.

- In addition;

  – Receive & send(microwaves).

  – Modulate/demodulate the signal using gateway modems.

  – Access server/gateways manage traffic.

  – Gateway provides a link to content providers.

  – Interface between gateways.

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NETWORK OPERATING CENTER

- uses cutting edge technology, equipment, and monitoring tools to proactively monitor critical network infrastructure.

- monitors power failures, communication line alarms and performance issues that may affect networks.

- special attention to avoid degraded service.

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DIVYA KARANAM

PRIMARY FUNCTIONS

- Network monitoring
- Incident Response
- Communication Management
- Reporting Problems
- bandwidth Management, IP management.

STAFF REQUIRED

➢ Supervisor
➢ Administrative staff
➢ Customer Service Representatives
➢ Business Planning & Management
➢ Marketing and Advertising
➢ Financial Manager
➢ Human Resource & Recruitment