АКТУАЛЬНЫЕ ВОПРОСЫ СПУТНИКОВОЙ СВЯЗИ
16-17 Июня, 2016 - Дубна, Россия
Константин Ланин
Hughes в России / СНГ

- 12 стран в Регионе
- Региональный офис в Москве: продажи, маркетинг и тех поддержка
- Ключевые потребители из правительственных, энергетических и банковских секторов в Регионе
- Более 70 000 VSATs
- 22 Региональных Оператора
- 35 HN + 18 HX NOCs в Регионе
- Jupiter HT - 10 лучей Экспресс АМ5
- - 10 лучей Экспресс АМ6

Услуги

- Космический сегмент, используемый в Регионе: Экспресс, Ямал, Казсат-3, SES, Евтелсат и Интелсат
- Сертификация на Региональной основе
- Решения «под-ключ», предпродажное и после продажное обслуживание, включая поддержку по маркетингу и техническому обслуживанию
Corporate Overview

EchoStar Corporation

HSS Corp

EchoStar Technologies

Video and Broadcast

EchoStar Satellite Services

Satellite Services

Hughes Network Systems

Data Services
Hughes Service Businesses

NORTH AMERICA (Germantown, MD)

EUROPE

INDIA (New Delhi)

SOUTH AMERICA (São Paulo, Brazil)
### Global Blue-Chip Enterprise Base

Hughes Is the Leading Provider to These End Markets

<table>
<thead>
<tr>
<th>Oil and Gas</th>
<th>Lodging</th>
<th>Financial</th>
<th>Retail</th>
</tr>
</thead>
<tbody>
<tr>
<td>bp</td>
<td>Wyndham Vacation Resorts</td>
<td>Edward Jones</td>
<td>Walgreens</td>
</tr>
<tr>
<td>ConocoPhillips</td>
<td>Choice Hotels International</td>
<td>citi</td>
<td>BEST BUY</td>
</tr>
<tr>
<td>NABORS</td>
<td></td>
<td>World Bank</td>
<td>DOLLAR TREE</td>
</tr>
<tr>
<td>PEMEX</td>
<td></td>
<td></td>
<td>SAFEWAY</td>
</tr>
<tr>
<td>State Bank of India</td>
<td></td>
<td></td>
<td>carter's</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Restaurants</th>
<th>Entertainment and Sports</th>
<th>Cellular Backhaul</th>
<th>Integrators and Service Providers</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>McDonald's</td>
<td>GTECH</td>
<td>Reliance</td>
<td>PrimeSys, Telstra, Telmex, TM</td>
<td>Texas Department of Public Safety</td>
</tr>
<tr>
<td>Subway</td>
<td>Cinemedia</td>
<td></td>
<td>Hutchison Max</td>
<td>NIC India</td>
</tr>
<tr>
<td>Jack</td>
<td>Vivomedia</td>
<td></td>
<td>Korea Telecom</td>
<td>MOFA, Saudi Arabia</td>
</tr>
<tr>
<td>in the Box</td>
<td>Spectrum</td>
<td></td>
<td></td>
<td>Social Security Admin.</td>
</tr>
<tr>
<td>Denny's</td>
<td></td>
<td></td>
<td></td>
<td>GETN</td>
</tr>
<tr>
<td>Sonic</td>
<td></td>
<td></td>
<td></td>
<td>Ethiopia Telecom</td>
</tr>
</tbody>
</table>
Driving Enterprise and Carrier Broadband Services Globally
More Than 5 Million Terminals Shipped

5 million

1 million

2002

2015
North American Enterprise Key Metrics

- More than 200+ Total customers
- 300,000+ Total sites in service
- Field installation staff headcount: 80
- Network Operations staff headcount
- Single network with 95,000+ sites
- Largest network
- Aggregate transponder capacity under management: 100
- Aggregate wireline capacity in and out of NOC facilities: 26Gbps
- Over 25 networks
- 1,000 sites
- 30 customers who have worked with us over 10 years
- 2,000+ Field installation staff headcount²
- Major corporate NOC facilities: 3
- Customer premise NOCs: 9
- Field maintenance staff headcount²: 400+

1. Excludes individual franchise/affiliate customers
2. Includes subcontract staff
# HughesNet

Over 1 Million Subscribers

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<table>
<thead>
<tr>
<th>Plan</th>
<th>Download Speeds Up to</th>
<th>Upload Speeds Up to</th>
<th>Total Data Allowance</th>
<th>Monthly Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime Plus</td>
<td>10 Mbps¹</td>
<td>1 Mbps¹</td>
<td>60 GB/month</td>
<td>$59.99</td>
</tr>
<tr>
<td>Pro Plus</td>
<td>10 Mbps¹</td>
<td>2 Mbps¹</td>
<td>65 GB/month</td>
<td>$79.99</td>
</tr>
<tr>
<td>Max</td>
<td>15 Mbps¹</td>
<td>2 Mbps¹</td>
<td>70 GB/month</td>
<td>$129.99</td>
</tr>
</tbody>
</table>

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¹ Based on eligible service tier. Actual speeds vary and are not guaranteed due to conditions of the receiving equipment, the equipment’s location, and upon the information received by Hughes. Accuracy of speeds provided by the International Telecommunication Union’s (ITU) website: [www.itu.int](http://www.itu.int).

### HughesNet Gen4 Residential

- **ORDER NOW BY PHONE**: 844-737-2700
- **ORDER NOW ONLINE**

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**Plan Highlights**

- **Prime Plus**: Great for multiple users, browsing, emailing, and social networking.
- **Pro Plus**: Ideal for multiple users, frequent browsing, social networking, watching video clips, and more.
- **Max**: Perfect for users who engage in heavy Internet use, watch video clips or download music, and more.
FCC Ranks HughesNet #1

HughesNet as #1 among all ISPs (satellite, telco and cable) in delivering advertised speeds (upload and download)
Global Market Opportunity

More people to be connected …
About 4 billion people unconnected to the Internet

Users consume more …
User will consume 37.1 GB per month by 2019
Household will consume 90.6 GB per month by 2019

Source: Cisco 2015 VNI

Source: ITU
Unserved and Underserved Is a Global Phenomenon

Hughes estimate of addressable market (households)

United States  Brazil  Russia  India  Indonesia

Source: Hughes Estimates

Several developing country challenges to be overcome
HTS Satellites Launched to Date
HTS Satellites Launched by 2018
EchoStar® 19

• 180 Gbps
  – More capacity
• 100+ beams
  – More coverage
• Higher VSAT throughput
  – More users
• Advanced networking
  – More services

Launch 2016
JUPITER System Is Versatile

C-Band        Ku-Band        Ka-Band
HTS            conventional satellite
Small networks  Large networks
Dedicated network  HNO/VNO network
Consumer            Schools
LTE Backhaul          Enterprise
VolP
Introducing DVB-S2X

Wideband  DVB-S2X  Efficiency  Performance

DVB-S2X/ACM with wideband operation

- Single channel 200+ Msps
- QPSK/8PSK/16APSK/32APSK modulation
- GSE formatted link for optimal efficiency
- 5% roll-off

JUPITER System is worlds first, and only, operational wideband system
HG200 Gateway Series
J2X Platform

HG220
Broadband Gateway
- Up to 6 forward channels
- 5 IF distribution
- Broadband carriers up to 70 Msps
- C-Band and Ku-Band
- Optional 70 MHz interface

HG240
Wideband Gateway
- Up to 6 forward channels
- 5 IF distribution
- Wideband carriers 200+ Msps
- Ku-Band and Ka-Band

HG260
Wideband Gateway
High Density
- Up to 16 forward channels
- 5 IF distribution
- Wideband carriers 200+ Msps
- Ku-Band and Ka-Band

HG200 Series Gateways includes:
- DVB-S2X
- Integrated L-Band switch
- 1:N redundancy
- Extensive virtualization

HG200 Options
- Console device
- Peering/Tunnel router
- NAT router and DPI
- NAS Array
- Second set of RF switched
HT2000 Series

DVB-S2X

100+ Mbps throughput

Features
- Compact desktop chassis
- Single cable IFL to Hughes ODU
- Wideband DVB-S2X
- FM-TDMA up to 12 Msp
  - OQPSK modulation

HT2000 Model Options

<table>
<thead>
<tr>
<th></th>
<th>HT2000</th>
<th>HT2004</th>
<th>HT2000W</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/100/1000 BaseT Ethernet Ports</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Integrated Wi-Fi 802.11n, 802.11ac</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

outdoor Unit (ODU) Options

- Hughes Radio: 2 watt Ku-Band, or 1 watt or 3 watt Ka-band
- Antennas: .74 meter, .98 meter, 1.2 meter or 1.8 meter
HT2300 Series

DVB-S2X

Features
- 4 (Four) 10/100/1000 BaseT Ethernet Ports
- Dual cable IFL to linear ODU
- Wideband DVB-S2X
- FM-TDMA up to 12 Msp
  - OQPSK or 8PSK modulation

100+ Mbps throughput

outdoor Unit (ODU) Options

- Linear Radio
  - C-Band, Ku-Band or Ka-Band
  - Varying BUC configurations

- Antennas
  - .74 meter, .98 meter, 1.2 meter or 1.8 meter
HT2500 Series

DVB-S2X

100+ Mbps throughput

Features
- Rack mount enclosure
- 4 (Four) 10/100/1000 BaseT Ethernet Ports
- Dual cable IFL to linear ODU
- Wideband DVB-S2X
- FM-TDMA up to 12 Msps
  - OQPSK or 8PSK modulation

Model Options

<table>
<thead>
<tr>
<th>Model Options</th>
<th>HT2524-24</th>
<th>HT2524-48</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+24 VDC power)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>(-48 VDC power)</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Outdoor Unit (ODU) Options

- Linear ODU
  - C-Band, Ku-Band or Ka-Band
  - Varying BUC configurations

- Antenna
  - 74 meter, .98 meter, 1.2 meter or 1.8 meter
HT2600 Series

DVB-S2X

100+ Mbps throughput

Features
- IP67 outdoor enclosure
- Two 10/100/1000 BaseT Ethernet Ports
- Dual cable IFL to linear ODU
- Wideband DVB-S2X
- FM-TDMA up to 12 Msps
  - OQPSK or 8PSK modulation

outdoor Unit (ODU) Options

<table>
<thead>
<tr>
<th>Linear Radio</th>
<th>C-Band, Ku-Band or Ka-Band Varying BUC configurations</th>
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<tr>
<td>Antennas</td>
<td>.74 meter, .98 meter, 1.2 meter or 1.8 meter</td>
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JUPITER Enterprise Capabilities

Every remote supports the key features which enterprises demand

- High performance Remotes
- Bandwidth Management
- QoS
- Rich IP Capabilities
- Security
- MPLS Integration
Market Segments

- Broadband
- Cellular Backhaul
- Mobility
- Digital Inclusion
- Enterprise
- Military
JUPITER System For Aeronautical Broadband

- Aero modem
- Aero terminal with dual Ku/Ka antenna

System Features
- Seamless beam switching
- Doppler compensation
- Spreading
JUPITER System For Cellular Backhaul

- Major operator in Bolivia
- Fixed lines
- Cellular services
- TV

500+ LTE backhaul network

Bridging digital divide in rural areas
The Most Widely Deployed HTS Ground System In The World

Over 1.2 Million HT Remotes Shipped
Satellite Industry Is Evolving To Meet Demand

**LEOs**
- OneWeb
- SPACEX

**HTS**
- INTELSAT
- eutelsat
- yahsat

**New Players**
- Facebook
- bharti
- Coca-Cola
Conclusion

Very Exciting Times In Satellite

Lots of Investment

Lots of Innovation

Big Opportunities