Alcatel-Lucent solutions for large enterprises
Leading technology for open, scalable multi-tenant systems

Enterprise / Mission Critical Networking
Data Center Interconnect
Data Center Network Automation
Enterprise IP Communications

Every success has its network
Key large enterprise networking challenges

**CHALLENGES**

- New applications requiring high bandwidth
- Roll-out of more and more security (physical, cyber)
- Reduced budget, need to optimise operations
- Regulations (railway, smart grids, etc...)
- Network control, security, and cost
- Complexity in provisioning and scaling
- Limited reach/performance of WAN in support of new applications
- Non-interoperable silos

**TECHNOLOGY REQUIREMENTS**

- Mission Critical Networks
- Private broadband network, or public with high SLA’s
- Secure, resilient, and high speed
- Automated operations
- Cost optimized
IP routing and optical transport
Industry specific CPE’s

- SROS
- 5G
- encryption
- NAT
- Firewall (future)
- IDS/IPS (future)
- -40°C +70°C
- IEEE1613
- IEC61850-3
- Fanless
- IP40
- DIN Rail
- 17.8 cm
- 15.2 cm
- 9.1 cm
- 24v/48v DC Power
- Alarms
- 2 x RS232
- Console
- Management
- 2 x 10/100/1000 with PoE
- & PoE+ (one port)
- 2 x 10/100/1000 UTP
- 2 x 10/100/1000 SFP

Enterprise / Mission Critical Networking

Every success has its network
IP routing and optical transport
Industry specific CPE’s

- 10G
- Encryption (IPSEC)
- NAT

- -40°C +55°C
- IEEE1613
- IEC61850-3
- Fanless
- IP65

- DC power
- AC power
- 2 Ethernet PoE+
- 3 Ethernet SFP

- Microwave radio
- GPS Receiver
- 1 Ethernet PoE+ (option)
- 2 Eth RJ45
- 4xDSL Bonding + 1 Eth RJ45

- AC power
- 3 Ethernet SFP

Every success has its network
Adaptive Grid Communications Network for Power Utilities
Intelligent Communication Network for Oil & Gas

- Offshore upstream
- Onshore upstream
- Subsea fiber
- LTE
- Access control
- Emergency communication
- Video protection
- PA/GA
- Environment monitoring
- Safety & security
- Microwave PMR
- IP/MPLS routers
- Hydrocarbons delivery & quality
- Instrumentation
- SCADA
- Process management
- Field automation
- Cyber security
- Infotainment
- Infrastructure supervision
- Multimedia center
- Workforce management
- Operations & living
- Microwave
- Optic
- M2M
- Control center
- Station
- 4G-LTE
- PMR
- IP/MPLS
- Midstream
- Downstream
Public Safety Ultra-Broadband IP Communications Network

Enterprise / Mission Critical Networking

Network Virtualization

Service aware management

IP/MPLS Backbone

Service Router

Network Operations Center

Optic

Emergency Operational Center

Firefighter HQ

Emergency Medical Service

Public Services

Police HQ

Access Router

Packet Microwave + Access Router

Fiber

Fire Station

Police Station

LTE RAN

Access

REAL TIME VIDEO AND DATA
FACE, LICENSE PLATE RECOGNITION
UAV
MISSION CRITICAL VOICE
VIDEO SURVEILLANCE
GEOLOCATION
BIOMETRICS
CONFERENCING
Ultra-Broadband IP and M2M platform for Smart City

Enterprise / Mission Critical Networking
IP routing and optical transport
City of Calgary

Creating a common network infrastructure for the City: ↑ security/efficiency, ↓ OPEX
(Case story + video + Flash)

<table>
<thead>
<tr>
<th>CHALLENGES</th>
<th>SOLUTION</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Exploding demand for bandwidth in growing city</td>
<td>▪ Full turnkey</td>
<td>▪ Smooth migration to a converged and shared IP/MPLS infrastructure consolidating separate networks</td>
</tr>
<tr>
<td>▪ Reduce OPEX and improve ROI (leased fiber)</td>
<td>▪ Mission critical IP/MPLS network for all authorities operations (administrations, public safety, transportation...)</td>
<td>▪ Risk mitigation/disaster recovery - no single point of failure,...</td>
</tr>
<tr>
<td>▪ Resilient &amp; redundant architecture (mirrored DCI)</td>
<td>▪ Core Network with 7750 SR, OmniSwitch 10K (10 Gb), and aggregation/edge with 7705 SAR, OmniSwitch (10 Gb)</td>
<td>▪ Consolidation of broadband/leased line requirements</td>
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<tr>
<td>▪ Meet the future demand for long-term sustainability</td>
<td></td>
<td>▪ Lease/sell to carriers the fiber surplus of fiber</td>
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<tr>
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<td>▪ Easier management</td>
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<td>▪ Ready to support real-time high speed applications (video, social media, customer service, collaboration,..)</td>
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Advanced 4G LTE Communications
Creating a Mine of the Future™

CHALLENGES

• Stay competitive in global mining industry amid market turbulence and uncertainty
• Significantly improve operational productivity through state-of-the-art communications infrastructure
• Increase production, decrease labor cost while increasing technology

SOLUTION

• LightRadio™, including distributed eNodeBs
• LTE Evolved Packet Core
• 7750 S/PGW, 7705 SAR, 7210 SAS-M,X
• 9500MPR
• 1830 PSS
• 8650SDM
• 5620 SAM cross-domain management (mobile and transport)
• Professional services: from project management to supervision

BENEFITS

• Increased productivity with Perth Remote Control Centre enabling real-time optimised operations – automated trucks, drills and trains to Iron Ore mine in Pilbara.
• Boost iron ore output capacity with real-time deep fully-integrated system visibility of mine planning and coordination work
• Optimisation of its truck fleet and maintenance savings

Rio Tinto IRON ORE - AUSTRALIA
## AEROPUERTO DE MALAGA/AENA, SPAIN

Network scope and applications:
- A converged multi-service network
- TETRA, CCTV, access control and luggage management
- WiFi access points

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| - WAN network interconnecting 50 airports  
- Become the Airport Service Provider | - 7750 SR, 7450 ESS, OS 6850 and 5620 SAM  
- IP/MPLS -VPLS network with multicast capabilities – 7450 & 7750 | - High performance network able to handle several thousand of multicast video flows  
- High resiliency and fast recovery mechanisms to support mission critical applications  
- Single and unified network with traffic isolation to serve different air-flight companies  
- Lower TCO with unified management |

Every success has its network
Key large enterprise data center interconnect challenges

**CHALLENGES**
- Network Security
- Latency
- Complexity in provisioning
- Data center consolidation

**TECHNOLOGY REQUIREMENTS**
- Secure data center connect
- High speed interconnect
- Automated operations
- High capacity
Data center interconnect
Power Utility Grid

**IP Routing and Ethernet Switching layer**

7750SR, 7705SAR, OMNI 6855

**IP Transport Infrastructure**

1830PSS (1GE and 10GE) with encryption and low latency

- PSS-16/32 FOADM, PSS-4 over C/DWDM or b/w
- OTN ADM on-a-blade
- 11QPEN4 packs for Encryption
Key large enterprise cloud challenges

CHALLENGES
• Faster application life cycle
• Risk, security, and compliance
• Big data analytics for business insight
• Data backup and recovery capabilities
• Platform modernization

TECHNOLOGY REQUIREMENTS
• Network virtualization
• Automation and centralized policies
• Improved management capability
Data center network automation
Nuage Networks Virtualized Services Platform

New Tenant / Application Request

Compute / Storage Management
- Compute Request completed in Minutes
- Auto-instantiation

SDN Controller
- Network Request completed in Minutes
- Auto-Configuration

Templates, Policies API

The Network:
- Automated
- Agile
- Programmable

Comput & Storage
- 100% Virtualized
- Instantaneous
- Easily consumable

RAPID, FLEXIBLE NETWORK SERVICE INSTANTIATION WITH CONSISTENT SECURITY
Key large enterprise communications challenges

CHALLENGES
• Consumerization
• ICT-enabled business innovation
• App store ecosystems
• Mobile, social and connected
• Shadow IT

TECHNOLOGY REQUIREMENTS
• Open platform for communications and collaboration
• Business applications on mobile devices
• Enterprise social networking
• Converge voice and data networks onto IP
Enterprise Communications

Use cases

- Build new apps quickly and easily
- Functions available to any app
- Robust API and simple client libraries
- Apps inherit privileges and security

Contextual Communications

- Presence
- Content Sharing
- Collaboration
- Voice to text
- Chat
- Video Calls
- Voice
- Conference Calling

Build new apps quickly and easily

Functions available to any app

Robust API and simple client libraries

Apps inherit privileges and security

Every success has its network
Every success has its network