Company Profile - Brief

Location

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730-13, Yeoksam-dong,
Gangnam-gu, Seoul 135-921,
Korea

Netmanias USA
3832 NE 88th Street
Seattle, WA 98115
USA

Networks
Analyze trends, technologies and market

POC Consulting
Training
Future
**Operator Challenges**

To attract more subscribers and prevent existing subscriber’s churn, operators should introduce new services differentiated from competitors, and deploy state of the art technologies. For providing these services, strategy for new network construction and legacy network migration is needed along with network design and system integration to achieve realization on the strategy. Accordingly, complicated technologies such as Authentication, QoS, Security and Provisioning, and Charging are accompanied. These technologies for network design and system integration mentioned above are obviously important for operators. However only their own efforts would bring so many burdens that operator itself maintains many internal experts and time to market.

**Solution: Netmanias Professional Service**

NMC Consulting Group/Netmanias was founded in year 2002, and is an advanced, professional network consulting company which is specialized for IP Network areas (e.g., FTTH, Metro Ethernet and IP/MPLS), service areas (e.g. eMBMS, IPTV, and IMS), and lastly, Wireless network areas (e.g. Mobile WIMAX and LTE).

NMC Consulting Group provides following services to the Operator (Green Field, Legacy),

- Service & Network Consulting Service
- Design and System Integration Service
- Operational Support Service
- Project Management and 3rd Party Coordination

**Benefits**

Professional services by NMC Consulting Group described above promise speedy and accurate design and implementation of network which can be satisfied operator’s business vision therefore it contributes absolutely to launch a commercial service as quickly as possible and operates network in stable condition. NMC Consulting Group outsourcing solution enables Operator to focus on its core business of marketing and sales.
**CORE EXPERTISE**

NMC Consulting Group/Netmanias was founded in year 2002, and is an advanced, professional network consulting company which is specialized for IP Network areas (e.g., FTTH, Metro Ethernet and IP/MPLS), service areas (e.g. eMBMS, IPTV, and IMS), and lastly, Wireless network areas (e.g. Mobile WIMAX and LTE).

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NMC Consulting Group | Netmanias has accumulated abundant field experiences and technical expertise in System Integration (SI) through 51 consulting and system integration projects conducted in various regions including Korea, Netherlands, Croatia, Russia, Saudi Arabia, Malaysia and India for the past 11 years.
NMC Consulting Group is a professional consulting firm committed to delivering time-to-market strategy & solution by providing End-to-end communication service solution & architecture, design of last-mile/backhaul/backbone network, and End-to-end System Integration Services with Multi-vendor Coordination & Project Management throughout the whole project.
Netherlands Versatel (Current Tele 2)

TPS Service based on ADSL2+

Netherlands Versatel IPTV Network Architecture

Data Center
- Amsterdam Data Center
- SSW (VoIP) Platform
- IPTV Platform
- NASS Platform
- Billing/C charging
- Order Mgt
- NMS/ EMS
- RBAC
- Network Virtualization
- Firewall/IPS

Nationwide Backbone Network (IP/MPLS)
- Core Node (4)
- Network Virtualization (MPLS L3 VPN)
- Internet
- IP Connectivity
- Redundancy
- Firewall
- etc.

Regional Network (L2 Metro Ethernet)
- Regional PoP
- Core Switch
- Core Router
- VoD
- IP/ MPLS Router
- IPTV Headend (Encoder, VoD, Middleware, etc.), VoIP Farm (SSW, SGW, TGW, etc.), BSS/OSS

Access Network (ADSL2+)
- CO Node (18)
- CO Node (24)
- DSLAM
- L2SW

Home
- Interworking with External Networks
- Interworking with BSS/OSS

Project Overview
- Target Service: Triple Play Service (Internet, IPTV and VoIP) based-on ADSL2+ technology
- Service Category: Retail TPS
- Integrated Network Equipments: IP STB, RG, DSLAM, Metro L2 SW, BRAS, IP/MPLS Router, IPTV Headend (Encoder, VoD, Middleware, etc.), VoIP Farm (SSW, SGW, TGW, etc.), BSS/OSS
- Duration: 12 months

Our Work-Scope (Design and Integration)
- Order Entry and Provisioning
- Topology Design
- Capacity Dimensioning
- IP Routing Design (IGP, BGP)
- MPLS Design
- Multicast Design (PIM, IGMP)
- E2E QoS Design
- Authentication (RG, STB, PPPoE, DHCP Options, etc.)
- IP Allocation
- Security, User Isolation
- Dynamic QoS (PDP, PEP)
- CPE/RG Provisioning
- Redundancy and Reliability
- Fault-Tolerance (IP Convergence, MPLS FRR, VRRP, RSTP, PBT, etc.)
- Data Center Design (IP connectivity, Redundancy, Firewall, etc.)
- Headend Design (Middleware, Encoder, VoD, DRM, Customer Portal)
- VoIP Design (RG, SSW, SGW, TGW, MS, etc.)
- Interworking with External Networks
- Interworking with BSS/OSS
Malaysia YTL

QPS Service based on Mobile WiMAX and Wi-Fi

**Project Overview**
- **Target Service**: QPS Services (Internet, VoD and VoIP) based on WiMAX and WiFi technology
- **Service Category**: Retail QPS
- **Integrated Network Equipments**: Handset, CPE, Wi-Fi AP, Wi-Fi AC, WiMAX RAS/ACR, WIMAX CSN, SBC, CSCF, HSS, MRF, MGC, MGW, SGW, IMS AS, L2/L3 Switch, Firewall, DPI, IP/MPLS Routers, BSS/OSS
- **Duration**: 20 months

**Our Work-Scope** (Design and Integration)
- Wi-Fi Network Entry/Authentication
- Wi-Fi Handover/Roaming
- Mobile WiMAX Network Entry/Authentication
- Mobile WiMAX Handover
- IMS Order Entry Process Design
- IMS Network Entry and Exit
- IMS VoIP Call Flow
- IMS AS Call Flow
- IMS Security
- End-to-End IMS QoS
- IMS NE Connectivity to IP Transport
- IMS NE Redundancy/Fault-Tolerance
- Cross-Layer (IMS, WiMAX, IP Transport) QoS Troubleshooting
- Charging (Prepaid, Postpaid)
- Provisioning
- IP Connectivity, IP Routing and IP Addressing
- Redundancy
- Interworking with YTL BSS/OSS

**Malaysia YTL Network Architecture**

**Data Center**
- **Kuala Lumpur Data Center (1)**

**Nationwide Backbone Network** (IP/MPLS)
- **Regional Backbone Network (L2 Metro Ethernet)**
- **Metro Backhaul Network (Microwave)**

**Devices**
- Cell Site
Project Overview

- **Target Service**: High speed Internet access based on WiMAX technology
- **Service Category**: Retail, Wholesale, IP-VPN
- **Integrated Network Equipments**: CPE, BS, ASN-GW, AAA, PM, OMA-DM, HA, DPI, DHCP, DNS, L2/L3 Switch, IP/MPLS Router, Microwave, BSS/OSS (Selfcare, CRM, Billing, Provisioning, Mediation)
- **Duration**: 13 months

Our Work-Scope (Design and Integration)

- Order Management (Activation, User Profile Change, Suspend, Deactivation, etc.)
- Provisioning (AAA, OTA)
- Authentication (EAP TTLS/AKA)
- IP Allocation (Simple IP, Mobile IP)
- QoS, Security
- Redundancy
- Charging (Prepaid, Postpaid)
- Hot-lining
- Policy Enforcement (PDP, PEP)
- Mobility
- CPE Management (OTA: CPE Provisioning, FW Upgrade, Diagnostics)
- IP VPN
- Wholesale (Traffic Separation and Interworking with other ISPs)
- Traffic Engineering and Capacity Dimensioning
- IP Connectivity (IP Routing, VLAN, IP Addressing)
- Data Center Design (IP connectivity, Redundancy, Firewall, etc.)
- Interworking with External Networks (Public Internet, ISPs)
- Interworking with Mobily BSS/OSS
**Project Overview**

- **Target Service:** QPS Service based on WiMAX technology
- **Service Category:** Retail QPS, Enterprise QPS
- **Integrated Network Equipments:** USB, CPE, Netbook, BS, ASN-GW, AAA, HA, DHCP, DNS, L2/L3 Switch, IP/MPLS Router, BSS/OSS (Selfcare, CRM, Billing, Provisioning, Mediation)
- **Duration:** 13 months

**Our Work-Scope (Design and Integration)**

- Order Management (Activation, User Profile Change, Suspend, De-activation, etc.)
- Provisioning (AAA)
- Authentication (EAP TTLS)
- IP Allocation (Simple IP, Mobile IP)
- QoS
- Security
- Redundancy (Link/Node/Geographical Redundancy)
- Charging (Prepaid, Postpaid)
- Hot-lining
- Policy Enforcement
- Mobility
- Traffic Engineering and Capacity Dimensioning
- IP Connectivity (VLAN, IP Addressing)
- Data Center Design (IP Routing, STP, IP connectivity, Redundancy, Firewall, etc.)
- Interworking with External Networks
- Interworking with Yota BSS/OSS

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**QPS Service based on Mobile WiMAX Technology**

**Design**

**Integration**

**Optimization**

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Moscow & Moscow Region

Two PoPs will be connected through only one GE link initially. Two 10GE links is a prospect for development.
**Peru Yota**

**QPS Service based on Mobile WiMAX Technology**

**Peru Yota IP/MPLS Network Architecture**

**Project Overview**
- **Target Service**: High speed Internet access service based on Mobile WiMAX technology
- **Service Category**: Retail
- **Integrated Network Equipments**: MS, BS, ASN-GW, AAA, DPI, DHCP, DNS, L2/L3 Switch, IP/MPLS Router, Firewall, Microwave, EMS, NMS, VPN, NPM and BSS/OSS (Selfcare, CRM, Billing, Provisioning, Mediation)
- **Duration**: 6 months

**Our Work-Scope (Design)**
- E2E Physical and Logical Network Architecture
- IP Routing (IS-IS, iBGP, eBGP)
- MPLS VPN
- Redundancy and Reliability
- Security
- QoS
- P2P Control
- IP Connectivity
- IP Addressing
- E2E Cross-Layer Troubleshooting on Production Networks
- Training
India RJIL
Reliance

Project Overview
- **Target Service**: Mobile IPTV service based on eMBMS technology
- **Service Category**: Retail
- **Integrated Network Equipments**: Device (Middleware, Modem Chip), MBMS GW, BM-SC, CDN, Headend (Live Encoder, Application Servers)
- **Duration**: 13 months

**Our Work-Scope (Design and Integration)**
- End-to-End eMBMS Service Network Architecture (Devices, eMBMS/BM-SC, CDN/Headend)
- End User Service Description (9 Use Cases)
- Subscription, Provisioning, Authentication Design
- eMBMS Broadcast Service
- Multicast Design (IP Multicast, LTE Broadcast)
- End-to-End QoS Design
- Redundancy Design
- Security Design
- Charging
- Device Requirements
- eMBMS Network Requirements

**eMBMS Service Network**

- **Design**
- **Integration**

- **Regional Center**
  - HTTP Adaptive Streaming
  - CDN Edge Server
  - OTT Packaging
  - MBMS GW
  - BM-SC

- **Headend**
  - Walled-Garden
  - CDN
  - Live Encoder
  - Live TV Feed
  - Ad server
  - VoD Portal
  - Middleware
  - Origin Server
  - Transcoding/Packaging
  - EPG
  - Statistics (TV rating, etc.)
  - Podcast
  - Emergency Alert
  - S/W Upgrade Server
  - News

- **OSS/BSS**
  - Selfcare
  - Provisioning
  - Charging
  - Billing Domain

- **Protocol**
  - MBMS: Multimedia Broadcast Multicast Service
  - BM-SC: Broadcast Multicast Service Center
  - DASH: Dynamic Adaptive Streaming over HTTP
  - FLUTE: File Delivery over Unidirectional Transport