

Service Assurance

An Approach For A Comprehensive & Pervasive
Solution

Future-Net

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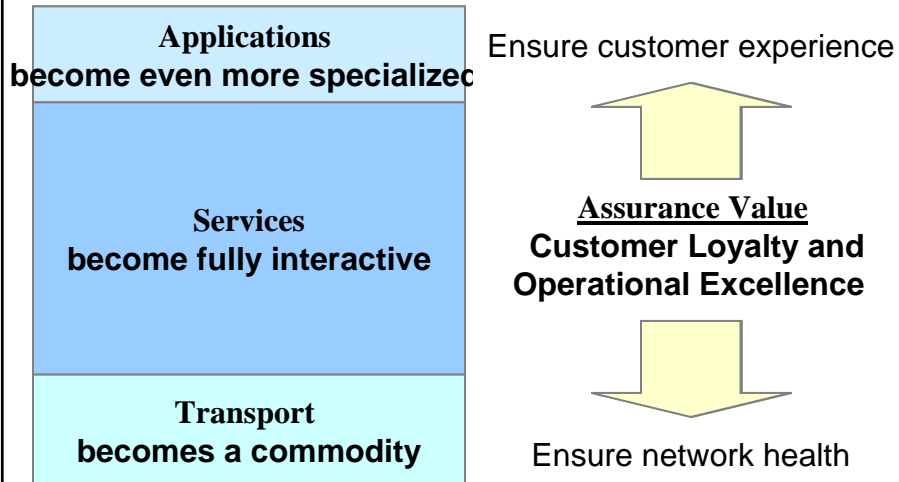
Overview

- ❖ The Case For Service Assurance
- ❖ Service Assurance Challenges
- ❖ Architecture And Implementation
- ❖ Examples

Service Life Cycle

	Service Test	Friendlies	Pilots	Market Expansion	Generally Available
Test	Can my architecture and equipment deliver the service?				
Build	Can my network support VoIP and IP Video – and the next new service?				
Operate	 <p>Performance Monitoring & Service Assurance</p>				
Customer Care					
Assurance					
Assurance	Can I guarantee all services and meet user expectations based on quality?				

It's about Converged Service Assurance



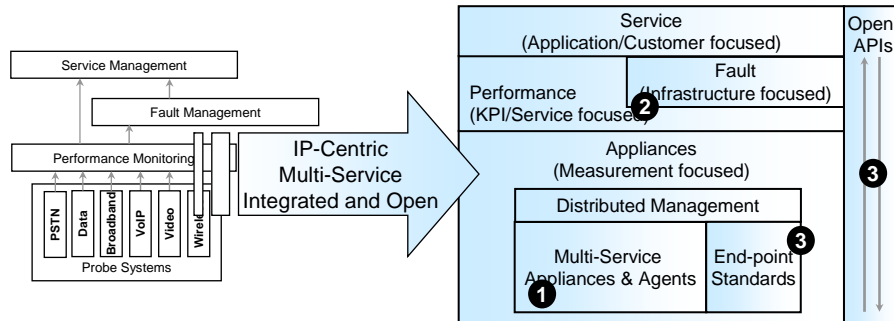
Transforming the Solution

Legacy Products

1. Silo'ed by technology
2. Fragmented by function
3. Closed by vendors

Next-Generation Products

1. Appliances and agents that support all services
2. Merger of Performance and Fault
3. Open data flow based on standards and APIs



Service Assurance Challenges

❖ Comprehensive

- Visibility across all layers (transport, control, service)
- Complete set of Key Performance Indicators
- Intelligent aggregation of metrics with correlation
- Life cycle coverage (distributed architecture that scales)
- OSS integration

❖ Pervasive

- Full visibility across the network and service
- End-to-end QoE visibility
- Native element of the service
- Cooperation between network elements



Comprehensive Assurance

- ❖ Complete Service Testing
 - Signaling Quality (SIP, H.248, Diameter)
 - Delivery Quality (Media Path for audio/video)
 - Session Quality (video/audio MOS)

- ❖ Complete Lifecycle Coverage
 - Build – Operate – Care - Assure
 - Distributed architecture, central management system, scalable as the service grows

- ❖ Complete Integration
 - Preserve investment in existing OSS
 - Network management, trouble ticketing, provisioning



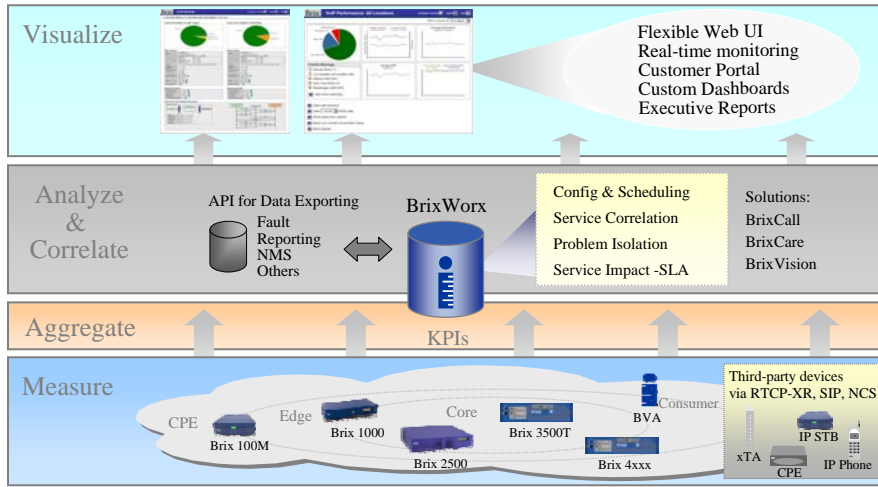
Pervasive Assurance

- ❖ End-to-End Network Visibility
 - Pervasive coverage: core, access, user
 - Partner networks

- ❖ Monitoring based on native protocols
 - SIP, H.248, H.323, MGCP/NCS, SCCP
 - RTP/RTCP/RTCP-XR, RTP Traceroute

- ❖ Cooperation with network elements
 - RTCP-XR, Media loopback (SIP)
 - Collection of data from Softswitch/Proxy

- ❖ KPI's based on open standards
 - ITU-T
 - IETF

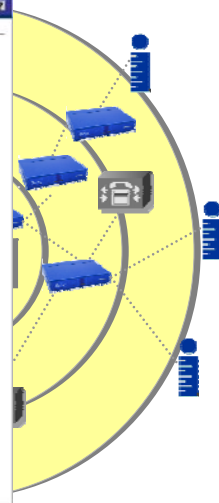
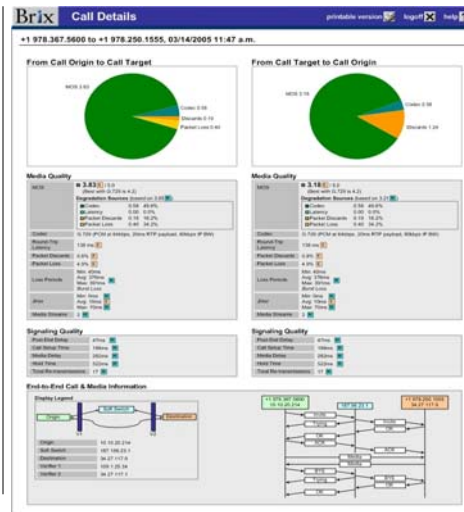


- ❖ **Active (*Synthetic Sessions*)**
 - Pro-active: see it before they hear it
 - Controlled scheduling: do not rely on users

- ❖ **Passive (*User Sessions*)**
 - Reactive: Measure actual user experience
 - Capture live network problems

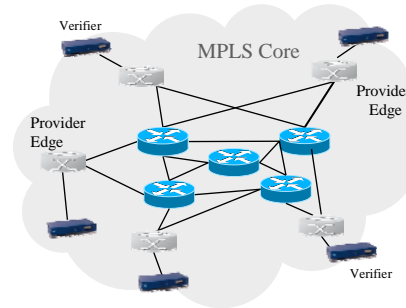
- ❖ **Collection (*Native Information*)**
 - Reactive: Cooperation with active elements
 - User traffic metrics

- Visualize
- Analyze
- Aggregate
- Measure

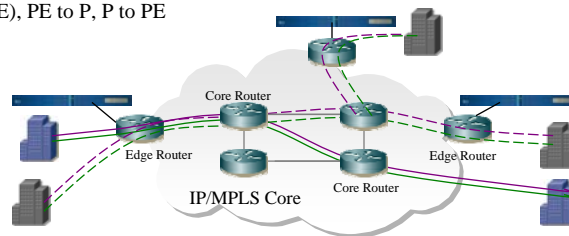


- ❖ L3/L4 KPI's
 - IETF IPPM
 - Types of packet loss, effects of jitter, round-trip and one-way latency
 - Accuracy of data
- ❖ Cooperation between elements
 - RTCP-XR: RFC3611, reporting of packet based statistics and VoIP specific metrics by endpoints
 - Media Loopback: MMUSIC working draft, monitoring from core to the edge
 - IPPM TWAMP
- ❖ Voice Quality (MOS)
 - G.107: E-Model, ETSI Extensions
 - P.VTQ: Derivation of voice transmission quality from non-intrusive IP protocol analysis
 - P.862 - Measurement based on reference signal (PESQ)
 - P.563 - Single-ended objective VQ assessment
 - P.562 – Analysis of voice impairments including noise and echo

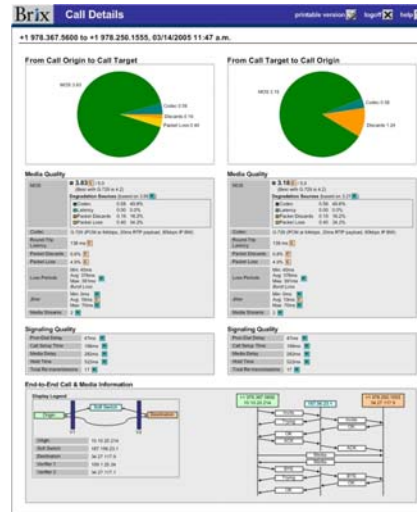
- ❖ Core performance verification
 - Measure core metrics
 - PE to PE Monitoring of latency, packet loss and jitter
 - PE to PE Traceroute and hop-by hop latency
 - Define granularity
 - IGP: Per PE to PE monitoring
 - Per Class of Service (5 Levels)
- ❖ A that solution provides
 - Core monitoring of mesh network
 - Loss, RT & one-way latency, jitter
 - RouteSleuth traceroute analysis
 - Multiple test meshes, one per QoS level, VPN, or Martini



- ❖ Providing end-to-end visibility for the VPN network
 - Passive measurement of traffic distribution between all sites
 - All packets/bytes transmitted to and received from each IP subnets of VPN are monitored
 - Measurements of key performance indicators (KPIs)
 - Latency, Jitter, Packet loss and availability – connect time/disconnect time
- ❖ Benefits to you
 - Measure full-mesh availability and performance between all sites
 - Enables service performance visibility for each path, e.g. customer edge (CE) to provider edge (PE), PE to P, P to PE



- ❖ **Monitoring and Aggregated Reports**
 - Detailed visibility to live customer calls
 - Per-call service analysis and troubleshooting
 - Call success/failures by type by region
 - Call quality (and impairments) by region
 - Average call duration, average call bandwidth
 - Peak hour statistics



- ❖ **Centralized correlation and reporting**
 - Call Quality Records reflect correlation of signaling, media, RTCP and RTCP-XR legs
 - Simple per call drill-down
 - Correlation with active measurements

- ❖ **Call volume – number of calls and number of minutes**
- ❖ **Grouped by Area Code**
- ❖ **Can also group by**
 - Country Code
 - Day – volume totals by day
 - Hour – volume totals by hour

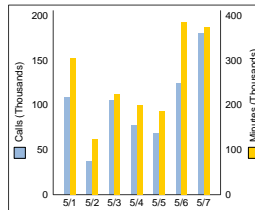
Call Volume: 05/01/2006 to 05/07/2006

Group Calls By:

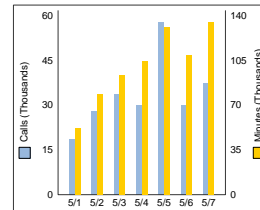
Time:

Filter:

Overall Total Calls



Overall Busy Hour Calls

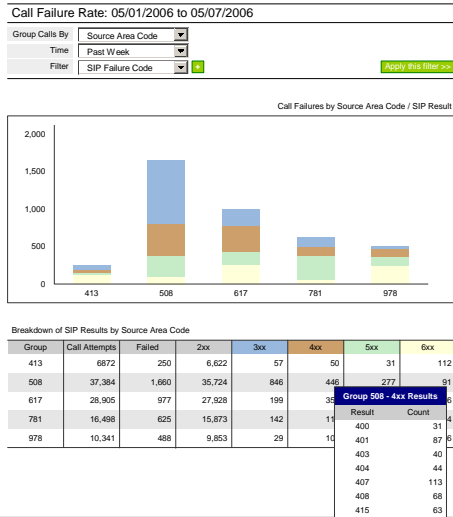


Calls by Source Area Code

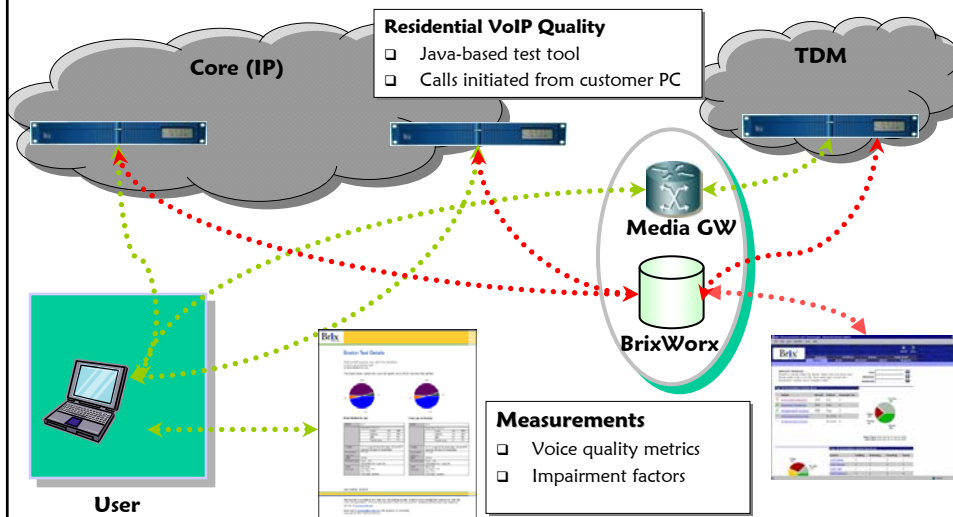
Group	Total Calls	Total Minutes
413	48,367	175,250
508	323,702	406,365
617	132,020	291,804
781	57,295	217,362
978	138,616	309,219

SIP & Call Failure Analysis

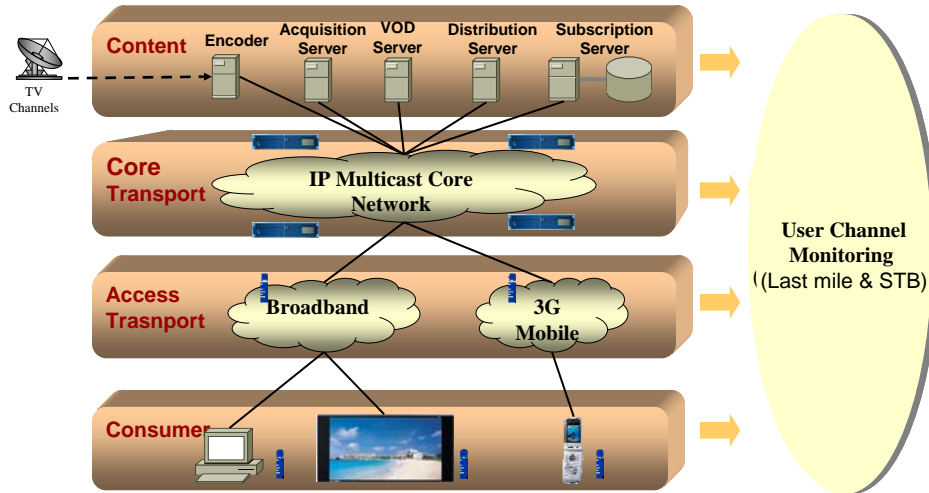
- ❖ Analysis of SIP codes
- ❖ Stacked bars highlight error code distribution across area codes
- ❖ Mouse-over provides totals for individual SIP error codes
- ❖ Grouped by Area Code
- ❖ Can also group by
 - Country Code
 - Day – failure totals by day
 - Hour – failure totals by hour



User VoIP www.TestYourVoIP.com

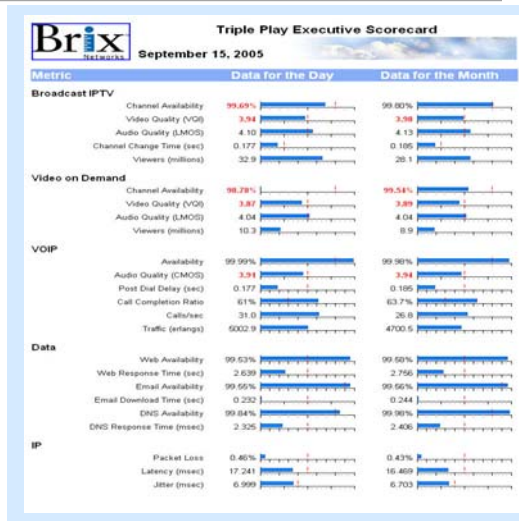


IPTV Full Network & QoE Visibility



Executive Scorecard

- ❖ Shows Key Service Assurance Metrics for a Triple Play Converged Service
 - Broadcast IPTV
 - VOD
 - VOIP
 - Data Services/IP
- ❖ Covers the entire network and multi-service reporting
- ❖ Used by
 - Service Owner
 - Network Executives



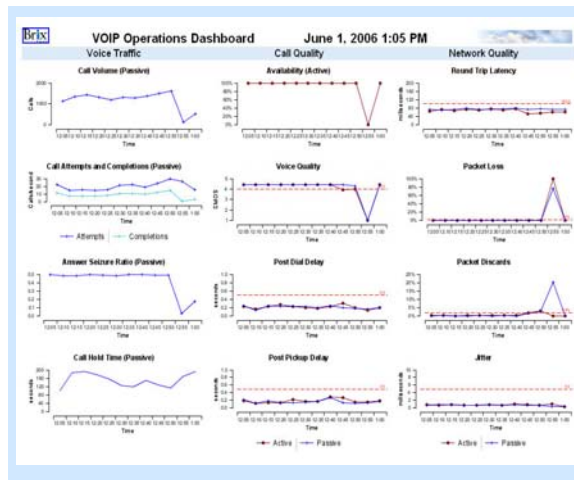
For Problem Isolation

- ❖ Determine if the problem is yours
 - Visibility across the full service
 - Ability to segment and isolate
- ❖ Correlation and location
 - Root-cause for quick problem resolution
- ❖ Proactive management
 - Identify and avoid potential performance problems
- ❖ Used by
 - Customer Care
 - Network Operations



Operations Dashboard

- ❖ Used in the NOC for real-time monitoring
- ❖ Shows recent (past hour) history of key VOIP metrics
 - Traffic
 - Call Quality
 - Network Quality
- ❖ Helps Operations Staff understand, detect, and fix current quality and usage problems





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