




SBE Ennes Workshop, Miramar, FL

AUDIO & VIDEO CONTRIBUTION OVER IP




Los Angeles Times -- January 10, 2009

Verizon Communications Inc., the second-biggest U.S. telephone company, plans to do away with traditional phone lines within seven years as it moves to carry all calls over the Internet.

An Internet-based service can be maintained at a fraction of the cost of a phone network and helps Verizon offer a greater range of services, Stratton said.

"We've built our business over the years with circuit-switched voice being our bread and butter...but increasingly, we are in the business of selling, basically, data connectivity," Chief Marketing Officer John Stratton said.





Audio & Video Contribution

- Outside Broadcast
- Dedicated Links
- Reportage



IP Network Technologies: Networks

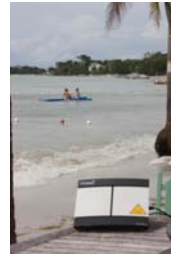
3G, 4G WiMax & LTE, Wi-Fi

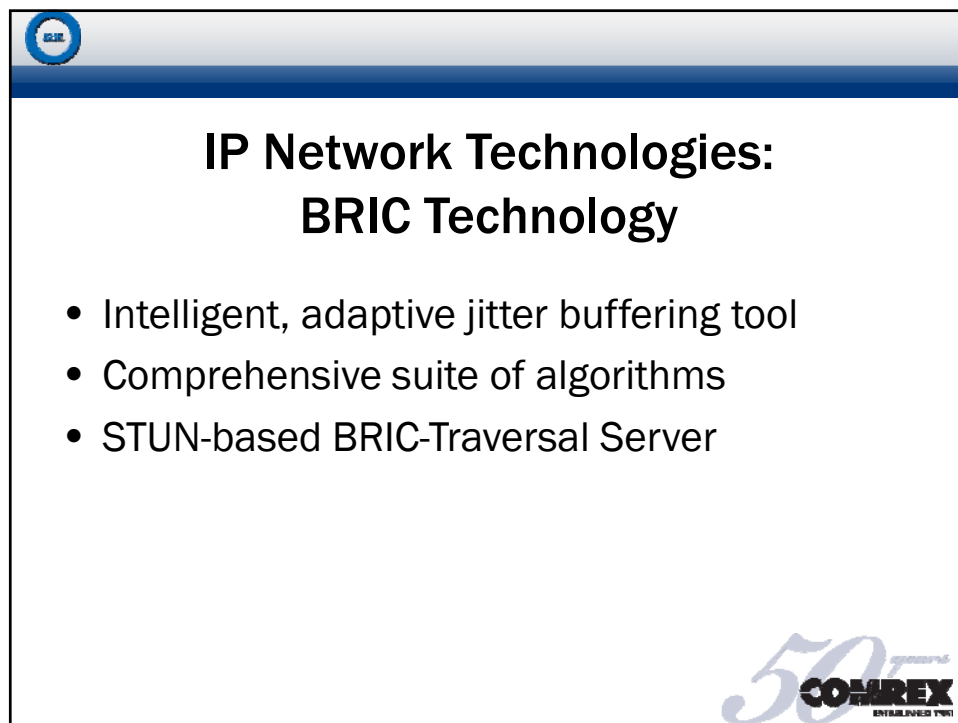
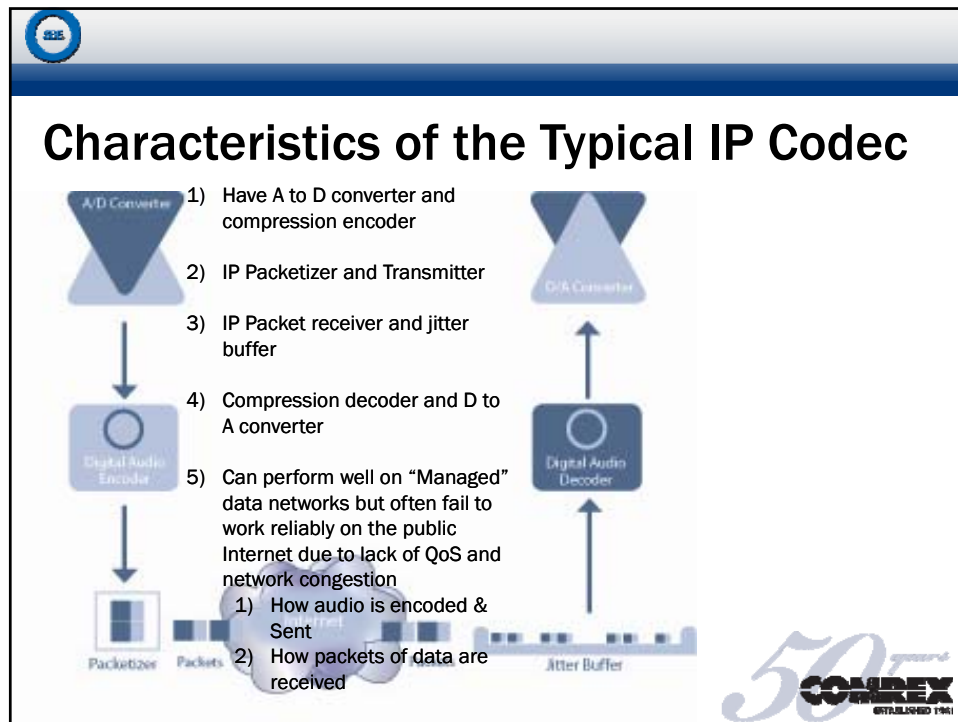



FLASH-OFDM devices



- Device supported with Integrated Drivers
- BGAN Support
- Optimized and customizable profiles

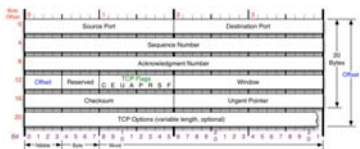








IP Network Technologies: BRIC Technology


- TCP vs. UDP





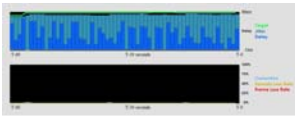
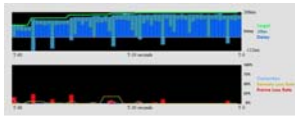
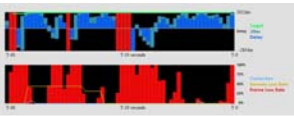
TCP Flags	Congestion Notification	TCP Options	Other
C E A P R S F	ECN (Explicit Congestion Notification) See RFC 3168 for full details, valid values below.	0 End of Options List 1 No Operation (NOP) Pad 2 Maximum segment size 3 Window Scale 4 Selective ACK ack 5 Timestamp	0 Number of 32-bit words in TCP header, maximum value of 5. Multiply by 4 to get byte count. RFC 753 Please refer to RFC 753 for the complete Transmission Control Protocol (TCP) Specification.
C Congestion Window	0 No Congestion	Checksum	
E Sack Permitted (ECN)	1 Congestion	Checksum of entire TCP segment and pseudo header (parts of IP header)	
A Sack ACK	2 No Congestion		
P Sack Push	3 Congestion		
R Sack Reset	4 Congestion		
S Sack Retransmit	5 Congestion		
F Sack Fin	6 Congestion		







IP Network Technologies: BRIC Technology

Three Different "Last Mile" connections via 3G

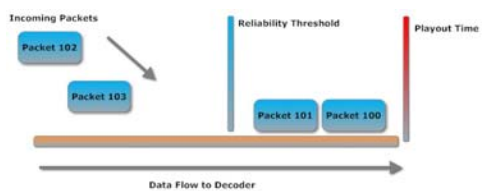











IP Network Technologies: BRIC Technology

- BRUTE – BRIC UDP Transmission Enhancement
 - UDP Reliability
 - Congestion Avoidance

IP Network Technologies: VoIP/SIP

- SIP RFC3261 (standardizes how calls are negotiated between caller and called parties)
 - Endpoint intelligence vs. Network intelligence
 - Negotiation between list of supported codecs
 - Smartphone proliferation
 - Interoperability standard for IP codec EBU Tech3326



IP Network Technologies: NAT & Firewall Traversal

STUN-
Session Traversal
Utilities for NAT

Figure 2 – The IP address you receive from the network may be many layers removed from your Internet IP

Internet Service Provider
70.22.155.131

Modem
70.22.155.131

Router
192.168.1.1

Router
10.0.0.1

Client Computer
192.168.1.101

ACCESS
10.0.0.49

ACCESS A

ACCESS B

Let's Chat

Internet

BRIC TS

To Internet: Client Computer (192.168.1.101)

To Internet: Client Computer (192.168.1.101)

50 COMREX
ESTABLISHED 1961

Production Environments: Studio

ACCESS Rack & BRIC-Link

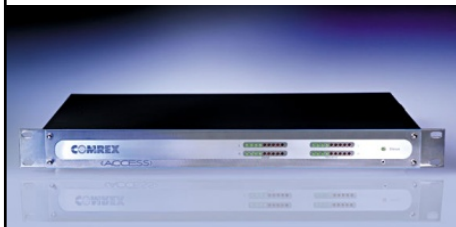
ACCESS Rack & BRIC-Link

BRIC-Link

50 COMREX
ESTABLISHED 1961



Production Environments: OB Vehicle



Production Environments: Sports

ACCESS Portable & Commentator Console





Production Environments: Stand-Alone

ACCESS Portable

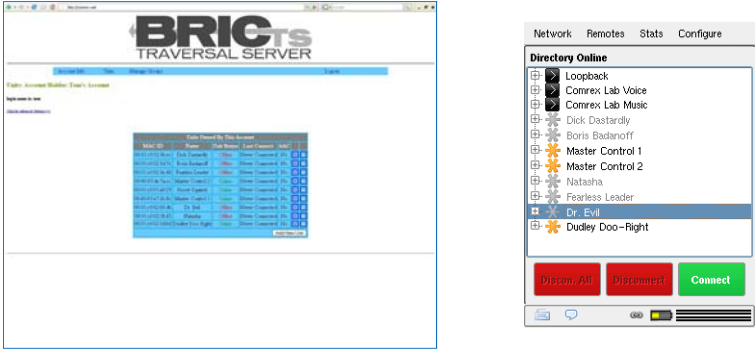




Management Tools: Device Manager



Management Tools: BRIC-TS

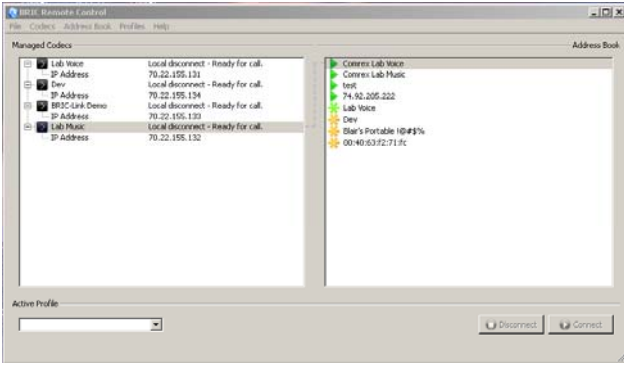


The screenshot displays the BRIC-TS Traversal Server interface. On the left, a window titled "BRIC-TS TRaversal SERVER" shows a table of connections. On the right, a "Directory Online" panel lists various devices and users, including Loopback, Comrex Lab Voice, Comrex Lab Music, and several Master Control units. At the bottom right of the interface, there are buttons for "Disconnect All", "Disconnected", and "Connect".

Host	IP	Port	State	Device
192.168.1.1	192.168.1.1	8080	Connected	Loopback
192.168.1.2	192.168.1.2	8080	Connected	Comrex Lab Voice
192.168.1.3	192.168.1.3	8080	Connected	Comrex Lab Music
192.168.1.4	192.168.1.4	8080	Connected	DiK Dastardly
192.168.1.5	192.168.1.5	8080	Connected	Boris Badanoff
192.168.1.6	192.168.1.6	8080	Connected	Master Control 1
192.168.1.7	192.168.1.7	8080	Connected	Master Control 2
192.168.1.8	192.168.1.8	8080	Connected	Natasha
192.168.1.9	192.168.1.9	8080	Connected	Fearless Leader
192.168.1.10	192.168.1.10	8080	Connected	Dr. Evil
192.168.1.11	192.168.1.11	8080	Connected	Dudley Doo-Right




Management Tools: BRIC-RC



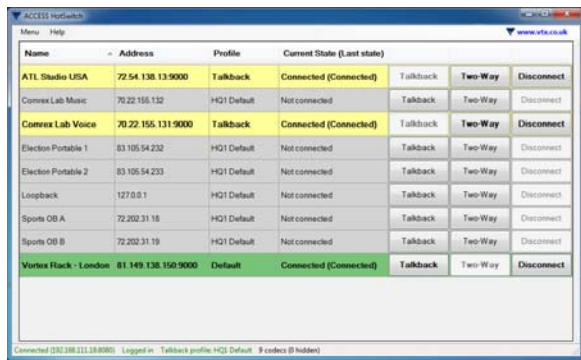
The screenshot shows the BRIC Remote Control interface. It features two main panels: "Managed Codes" on the left and "Address Book" on the right. The "Managed Codes" panel lists various codes with their IP addresses and states, such as "Lab Voice" and "Dev". The "Address Book" panel lists contact information for "Comrex Lab Voice" and "Comrex Lab Music". At the bottom, there is an "Active Profile" dropdown menu and "Disconnected" and "Connect" buttons.

Code	IP Address	State
Lab Voice	70.22.155.131	Local disconnect - Ready for call.
Dev	70.22.155.134	Local disconnect - Ready for call.
BRIC Lab Demo	70.22.155.133	Local disconnect - Ready for call.
Lab Music	70.22.155.132	Local disconnect - Ready for call.







Management Tools: HotSwitch





Name	Address	Profile	Current State (Last state)	Talkback	Two-Way	Disconnect
ATI Studio USA	72.54.138.13.9000	Talkback	Connected (Connected)	Talkback	Two-Way	Disconnect
Comrex Lab Music	70.22.155.132	HQ1 Default	Not connected	Talkback	Two-Way	Disconnect
Comrex Lab Voice	70.22.155.131.9000	Talkback	Connected (Connected)	Talkback	Two-Way	Disconnect
Election Portable 1	83.105.54.232	HQ1 Default	Not connected	Talkback	Two-Way	Disconnect
Election Portable 2	83.105.54.233	HQ1 Default	Not connected	Talkback	Two-Way	Disconnect
Loopback	127.0.0.1	HQ1 Default	Not connected	Talkback	Two-Way	Disconnect
Sports OB A	72.202.31.18	HQ1 Default	Not connected	Talkback	Two-Way	Disconnect
Sports OB B	72.202.31.19	HQ1 Default	Not connected	Talkback	Two-Way	Disconnect
Vortex Rack - London	81.149.138.150.9000	Default	Connected (Connected)	Talkback	Two-Way	Disconnect

In Development

- **STAC VIP**—Wideband “HD” Voice for Talkshows
 - Skype
 - Smartphone
 - IP PBX
 - Legacy POTS
- **LiveShot**—Live, Real-time video
 - Record, store & forward
 - 3G, 4G, Wi-Fi, BGAN, Broadband
 - Data Channel bonding
 - Built-in IFB and return video



Thank you from everyone at Comrex

