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ip.buffer range

ip.1-32	one port, one channel with 32Mb memory
ip.4-128	four ports, four channels with 128Mb memory
ip.4-1024	four ports, four channels with 1Gb memory

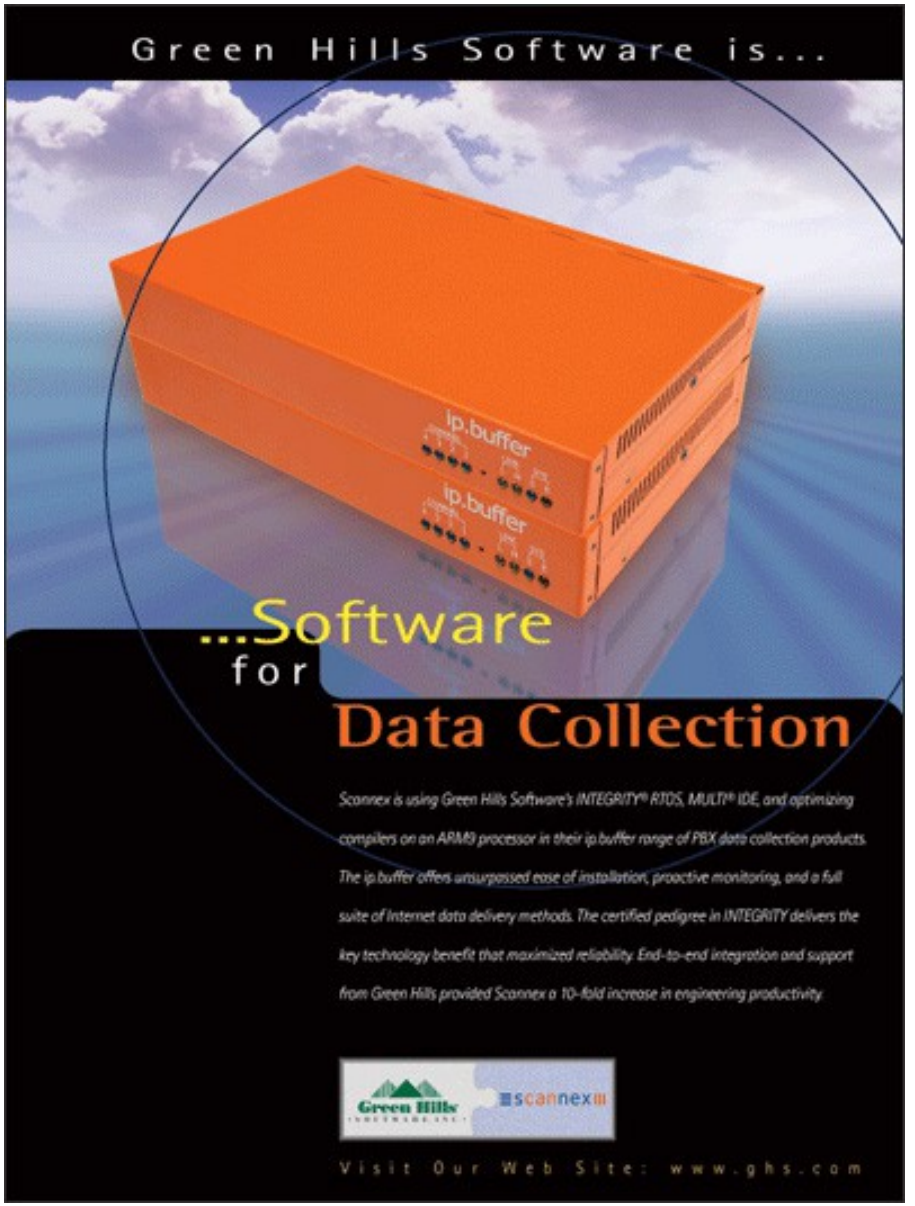
options

ip.n-n**.m**	global POTS/PSTN modem
ip.n-n**.g**	quad-band GPRS modem

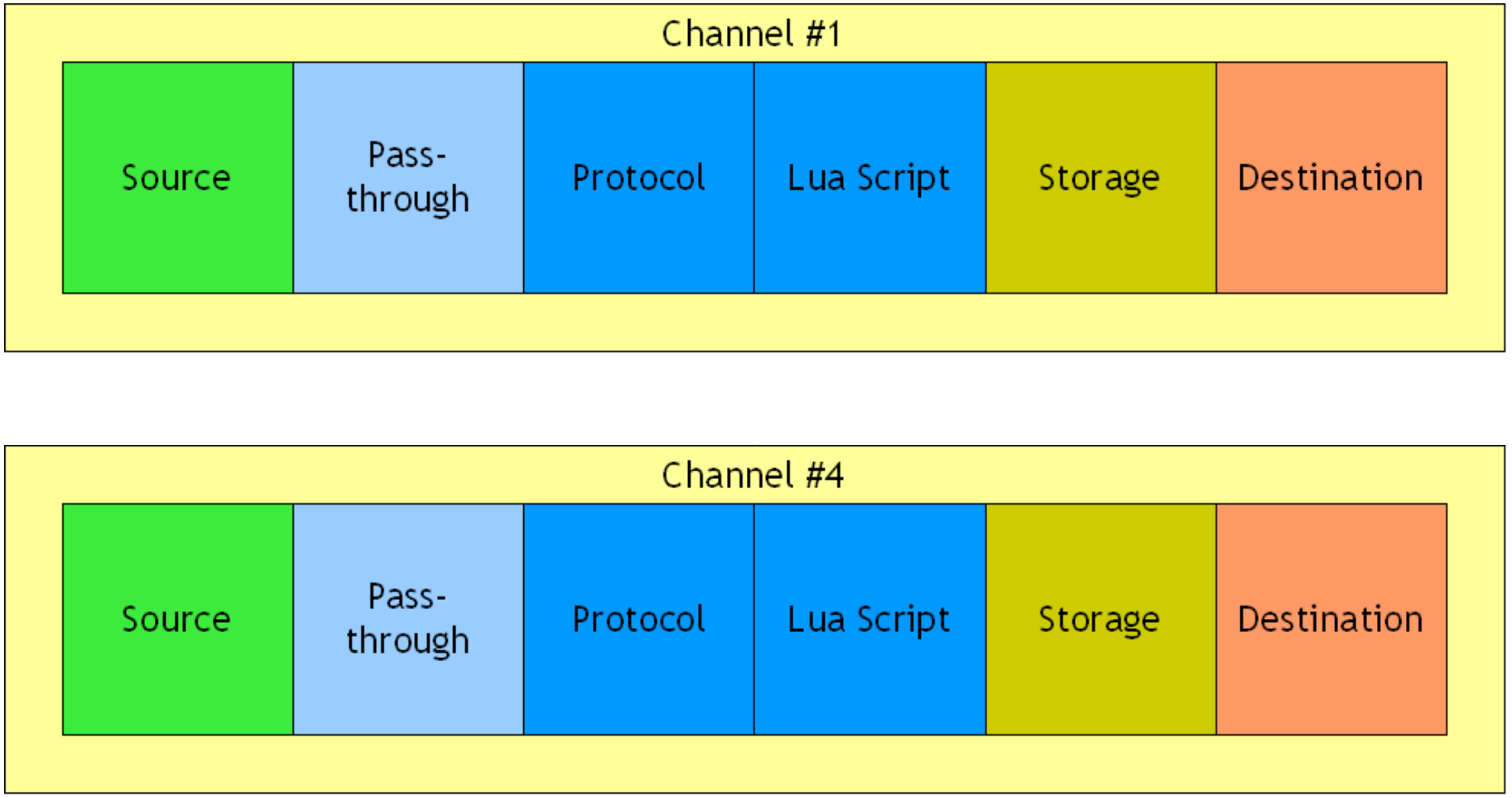
Operating System

- *"The INTEGRITY RTOS (Real Time Operating System) is designed for use in embedded systems that require maximum reliability and absolute security. INTEGRITY represents the most advanced RTOS technology on the market today."*
- Used in many critical and remote applications
- See www.ghs.com

Green Hills
• SOFTWARE, INC. •
INTEGRITY

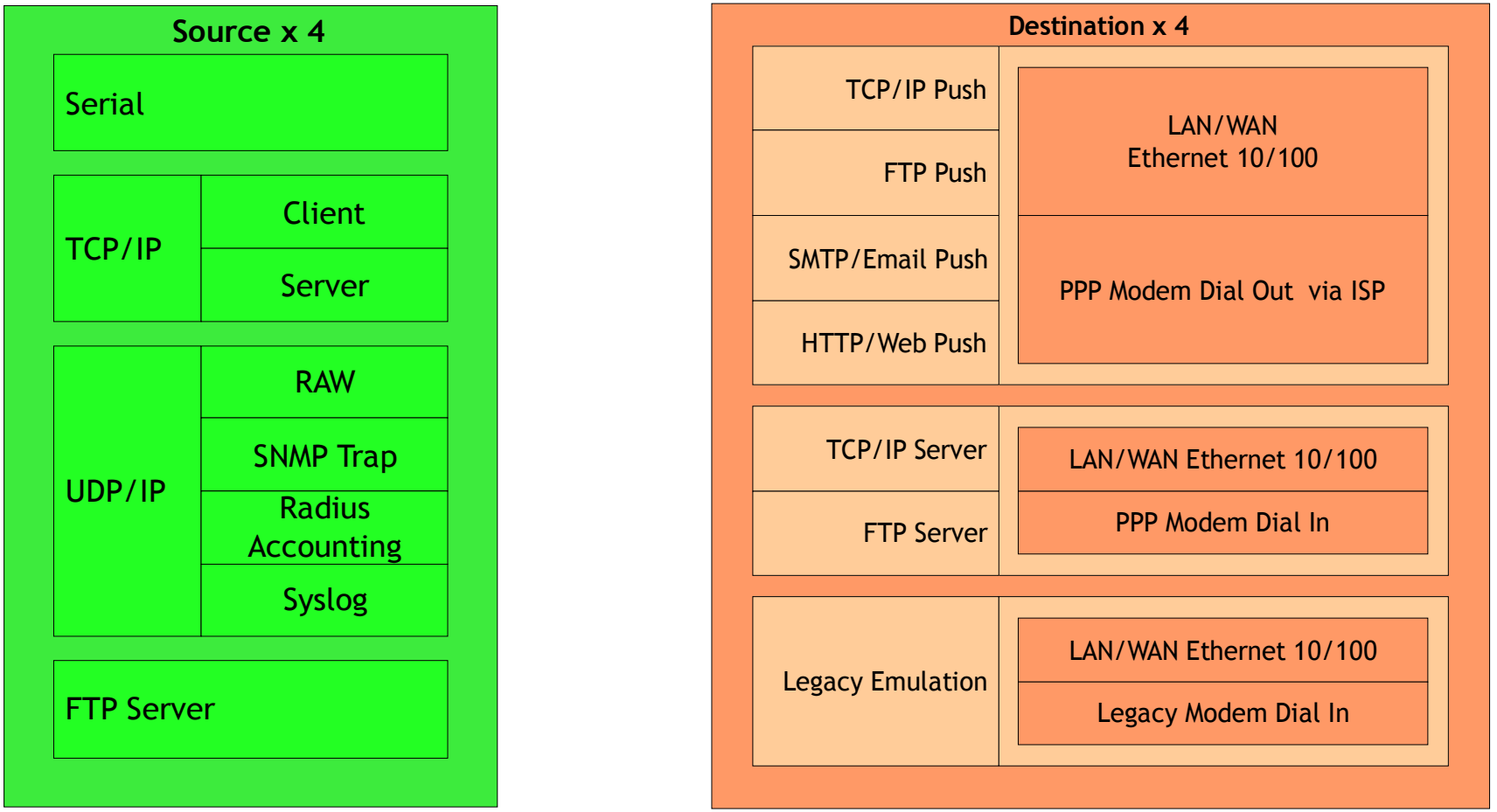


Channels

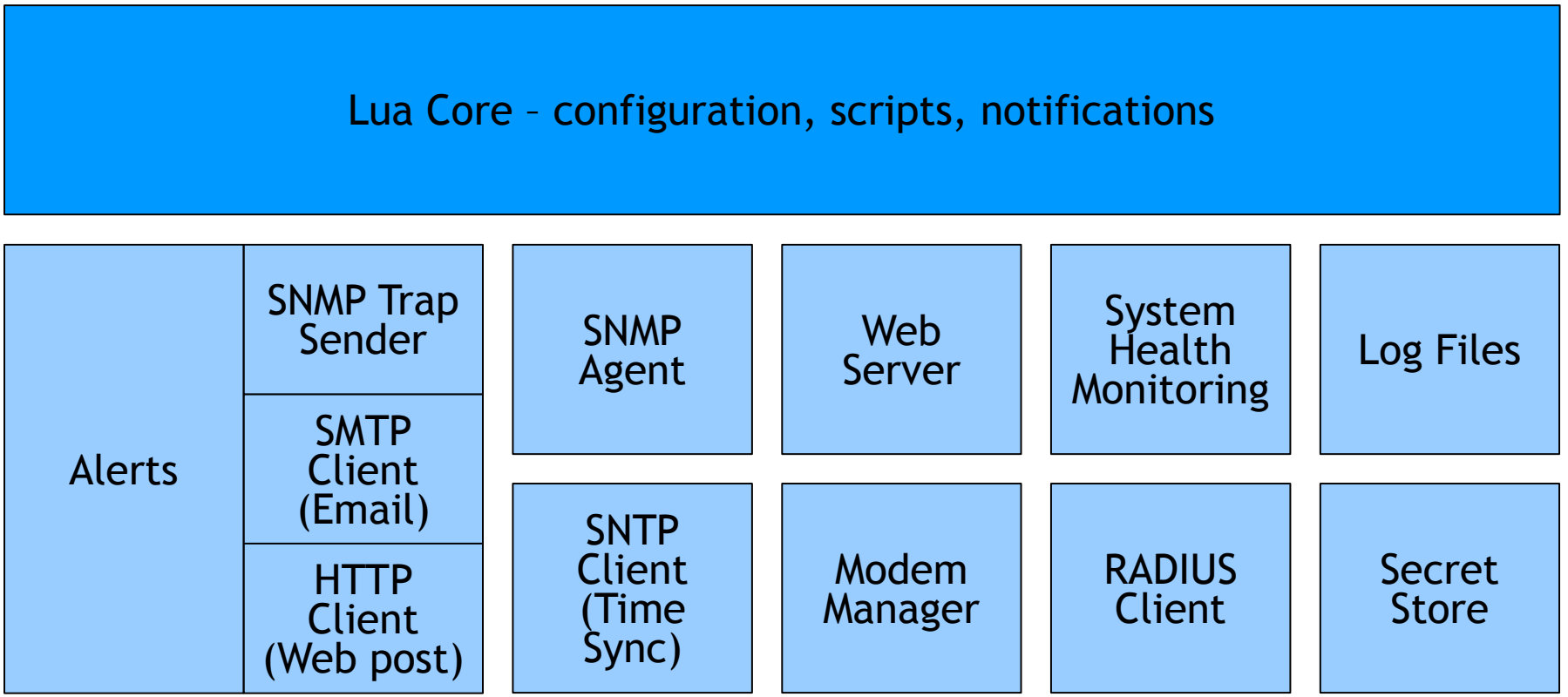


Channels can be set independently

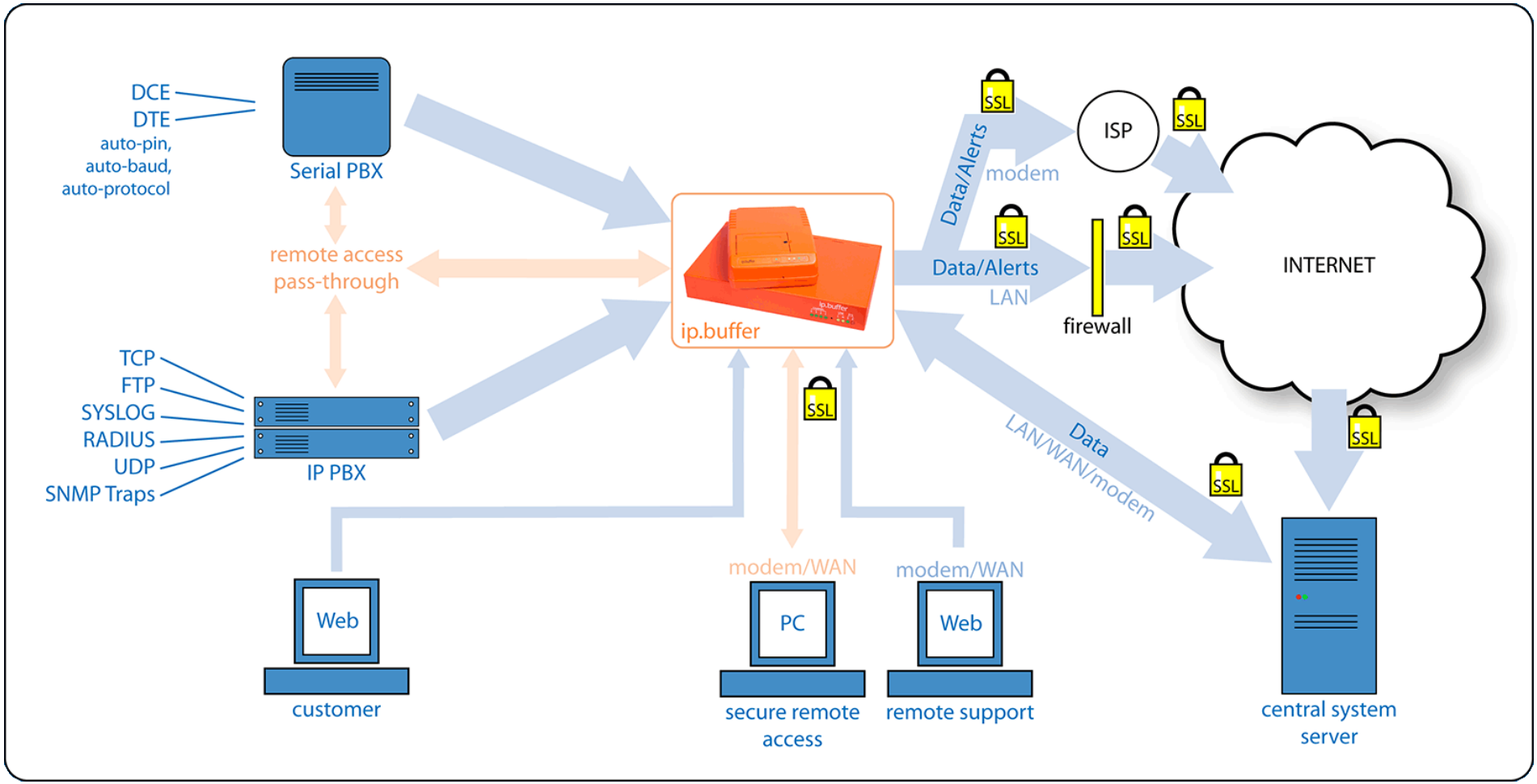
Source/Destination



System Core


Lua Core – configuration, scripts, notifications
Alerts
SNMP Trap Sender
SMTP Client (Email)
HTTP Client (Web post)
SNMP Agent
Web Server
System Health Monitoring
Log Files
SNTP Client (Time Sync)
Modem Manager
RADIUS Client
Secret Store

Example Connection



Collection Options

CDR and Alarm Collection from:

- Serial with auto-pin & auto-baud detection
- TCP/IP, Telnet, FTP, UDP, SNMP Traps and Syslog
- Radius Call Accounting
- Binary & ASCII

Scripted PBX Protocols:

- ASCII Lines, Alcatel PCX, Avaya RSP
- Binary (full 8-bit)
- InterTel Axxess & 5000, iSDX Binary
- NEC NEAX Serial & TCP/IP
- Nortel (Meridian & Norstar & BCM LiveStream)

PBX support for Cisco CCM5+ & CCME

Multi-homing for fixed IP switches

Delivery Options

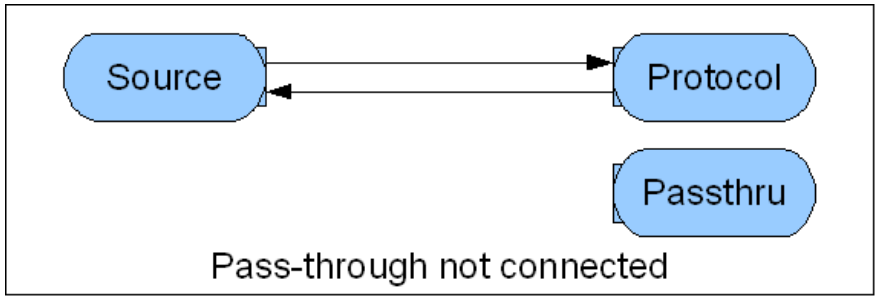
Network/Modem delivery options:

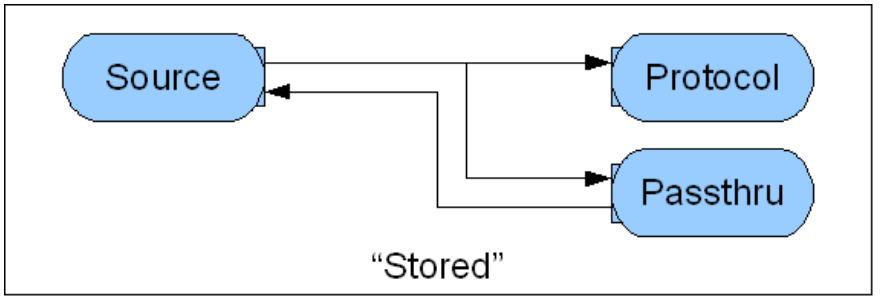
- TCP/IP (Client & Server)
- FTP (Server & Triggered Push)
- SFTP (Trigger Push)
- Email (Triggered)
- HTTP/HTTPS post to standard web server

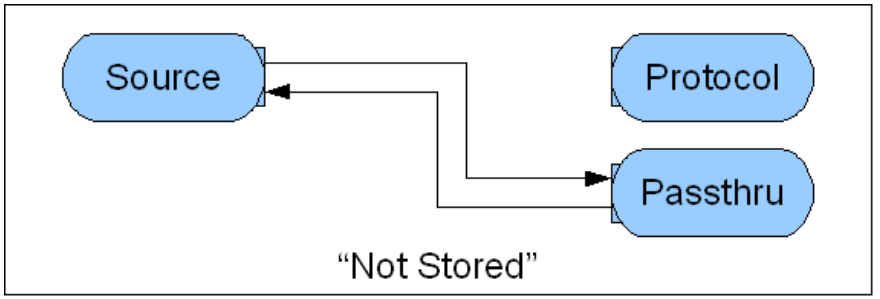
Internal scheduler for FTP/HTTP/Email (per channel)

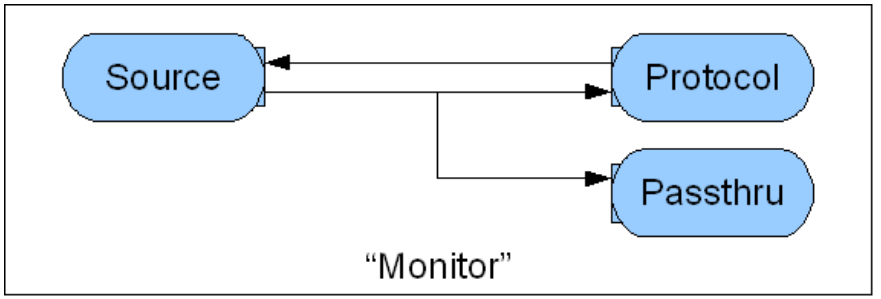
zlib Data Compression on Delivery (FTP, HTTP, Email)

Pass-Through for Moves & Changes









Scripting

- Scripted PBX Protocols
- Scripted Record Processor e.g.
  - Alarm and Fraud detection
  - Record Filtering and Modification
- Scripted emulation of legacy buffers

Management

- Web Server (http & https) for Configuration
- RADIUS authentication
- SNMP Agent
- Syslog output for Configuration & Authentication
- Audit Log
- Remote Fail-Safe Firmware Upgrades
- CHAP/PPP Modem Dial-In
- Real-Time-Clock (battery backed) with SNTP & DST
- Centrally managed updates using http/https

Security

- TLS/SSL Encrypted, AES-256, Connections for all delivery methods
- TLS/SSL option for web server (https)
- SFTP over SSH secure push
- Certificate generation

Alerts

- Source Connect/Disconnect (COM & TCP)
- Data Quiet (with scheduler)
- Percentage Full alarms
- Comfort, Reboot, Config & Authentication
- SNMP Traps (compatible with HP OpenView)
- ip4 includes internal temperature monitor (upper & lower limits)

Modem

- 33.6k Global POTS/PSTN Modem
  - uses TCP/IP protocols over PPP
  - Legacy support for “dumb” modem dial-in
- Quad Band GPRS Cellular Modem
  (including 'nailed-up' connection option)
- Dial out to ISP or direct to RAS Server
- Option for Fallback to modem when LAN unavailable
- Dial-in for Collection & Administration with fixed or auto IP
- Pass-Through available over modem

Installation

- Auto pin, baud and protocol detection and configuration
- Auto cross-over on 10/100 Ethernet
- Network configuration tool
- Live record view
- Upload/download of configuration files and scripts

General

- 2 hour Battery backup (batteries not supplied)
- Kit includes all cables, adaptors and PSU
- ip4 only: isolated -48VDC supply option
- Rack mount kit

Documentation

User Guides and Data Sheets are available from the **Downloads** page of our website at:

www.scannex.com

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ip.buffer range

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options

ip.n-n**.m**	global POTS/PSTN modem
ip.n-n**.g**	quad-band GPRS modem

All Scannex buffers use the same firmware, and offer the same data collection, delivery and security features.

The difference is just in the number of ports, channels, memory, and modem options!

Operating System

- *"The INTEGRITY RTOS (Real Time Operating System) is designed for use in embedded systems that require maximum reliability and absolute security. INTEGRITY represents the most advanced RTOS technology on the market today."*
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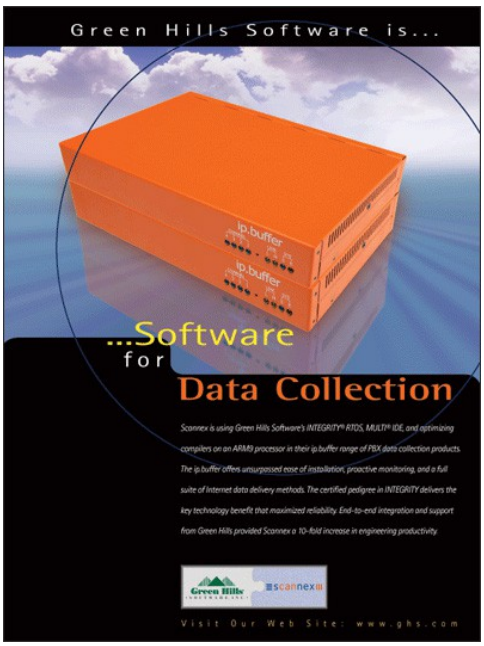


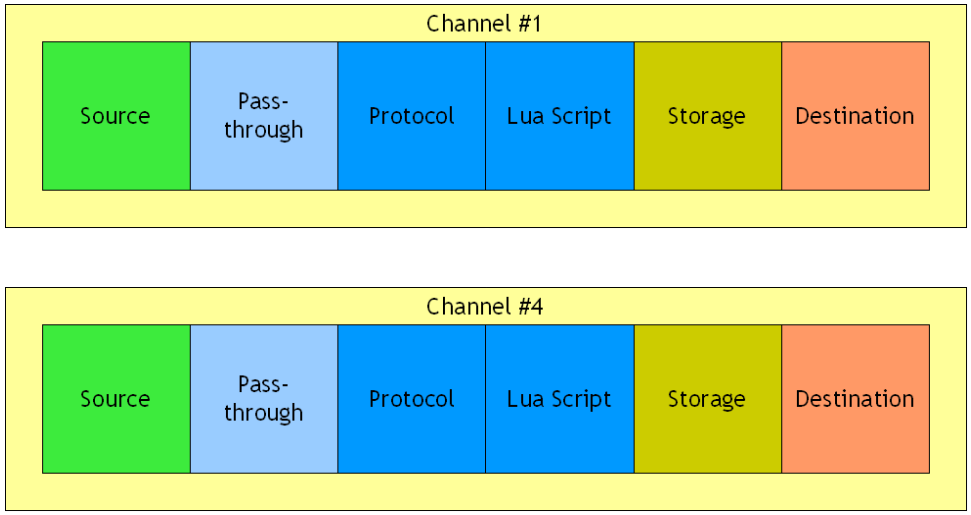
Green Hills Software are well known for providing the rugged and reliable INTEGRITY operating system. It is used in many military, aeronautical, automotive, industrial, and medical applications.

INTEGRITY has been approved at the NSA's level EAL6+ - "High robustness". It is the only operating system approved at this level!

Scannex chose INTEGRITY for its robustness, reliability and pedigree. Scannex are supported by Green Hills Software.

See http://www.ghs.com/customers/scannex.html

Channels



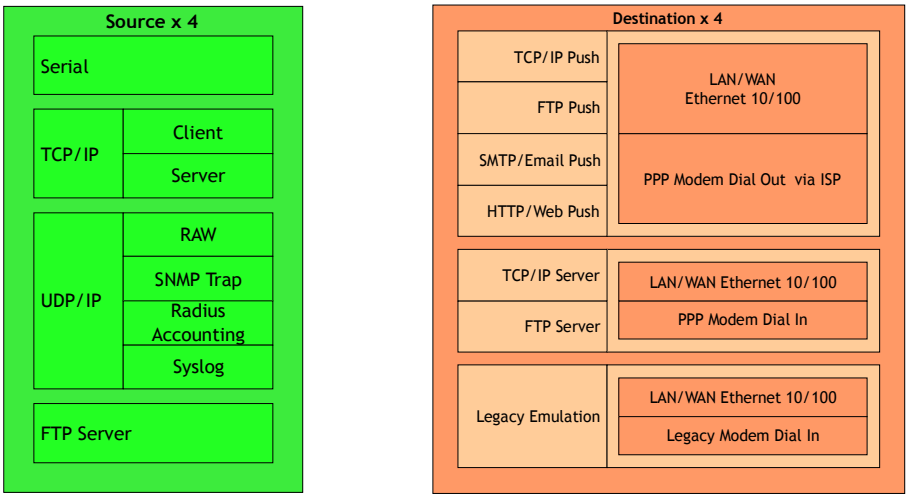
Channels can be set independently

The ip.buffer is “channel based”. Each channel is configured and operates independently.

You can mix-and-match COM and TCP collection, or collect from multiple TCP sources with one ip.buffer!

Each of the stages of a channel will be discussed in the following slides...

Source/Destination



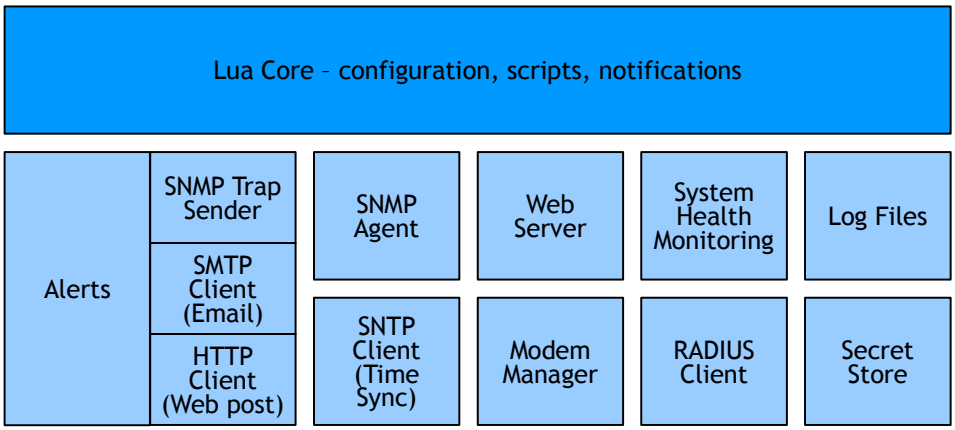
Sources include:

- standard **COM**/serial ports
- **TCP/IP** based devices (e.g. Alcatel, Siemens, NEC, Avaya, InterTel, Norstar BCM LiveStream, etc)
- **UDP/IP** based devices (e.g. Traps, syslog, RADIUS accounting)
- **FTP** push data (e.g. Cisco CCM5+)

Destinations include:

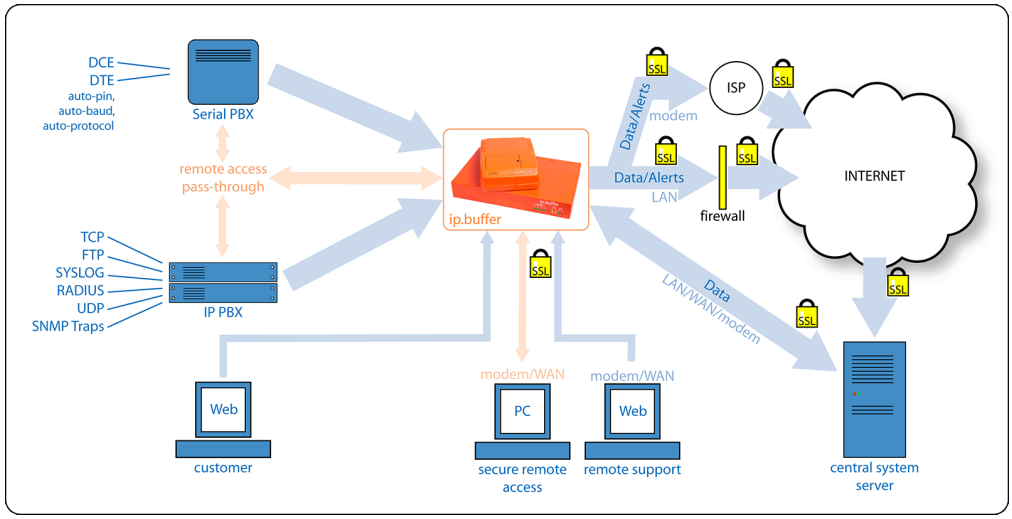
- "**Push**" methods:
  - TCP, FTP, SFTP/SSH, Email, Web HTTP
  - Over LAN/WAN, Internet, or Dial-up
- "**Pull**" methods
  - TCP, FTP
  - Over LAN/WAN, or Dial-in with PPP
- **Legacy** emulation for slot-in replacement of older devices

System Core



- At the core of the ip.buffer is the **Lua scripting** language.
- The **Alert core** is responsible for sending SNMP Traps, Emails, and Web alerts for critical events (more on the following slides).
- The **SNMP Agent** is useful for large networks – IT staff can inventory their network.
- The **SNTP Client** synchronises the time with public time servers.
- The **Web Server** is used for simple configuration and management.
- The **System Health Monitoring** works with INTEGRITY and ensures that the ip.buffer keeps running.
- The **RADIUS Client** allows the ip.buffer to check passwords against a central password store (used in large corporate networks).
- The **Log Files** keeps an audit log of activity on the ip.buffer
- The **Secret Store** holds passwords, certificates – ensuring the privacy of the ip.buffer and network.

Example Connection



- The ip.buffer is ideally suited to managed service solutions.
- Data can be collected from a very wide range of devices
- Data can be delivered across the public Internet – protected by industry-standard SSL encryption
- The central system can be a standard web-server (e.g. IIS or Apache), an FTP-server, or a custom written TCP server. You no longer need racks of high-maintenance modems (though the ip.buffer can support that paradigm if needed)
- The ip.buffer can make use of the customer's existing DSL connection – using “firewall friendly” protocols like HTTP or HTTPS.
- If the DSL line fails the ip.buffer can be programmed to fall back to a dial-up ISP connection – providing very high availability of data back to the central system.
- If the ip.buffer modem is connected to an incoming line then the support staff can gain complete access to the ip.buffer using a PPP dial-in connection. This makes it simple to diagnose connection issues and even to completely reconfigure the buffer.
- Secure remote moves-and-changes is possible – either using the ip.buffer's modem or across a WAN/LAN.

scannex III

Collection Options

CDR and Alarm Collection from:

- Serial with auto-pin & auto-baud detection
- TCP/IP, Telnet, FTP, UDP, SNMP Traps and Syslog
- Radius Call Accounting
- Binary & ASCII

Scripted PBX Protocols:

- ASCII Lines, Alcatel PCX, Avaya RSP
- Binary (full 8-bit)
- InterTel Axxess & 5000, iSDX Binary
- NEC NEAX Serial & TCP/IP
- Nortel (Meridian & Norstar & BCM LiveStream)

PBX support for Cisco CCM5+ & CCME

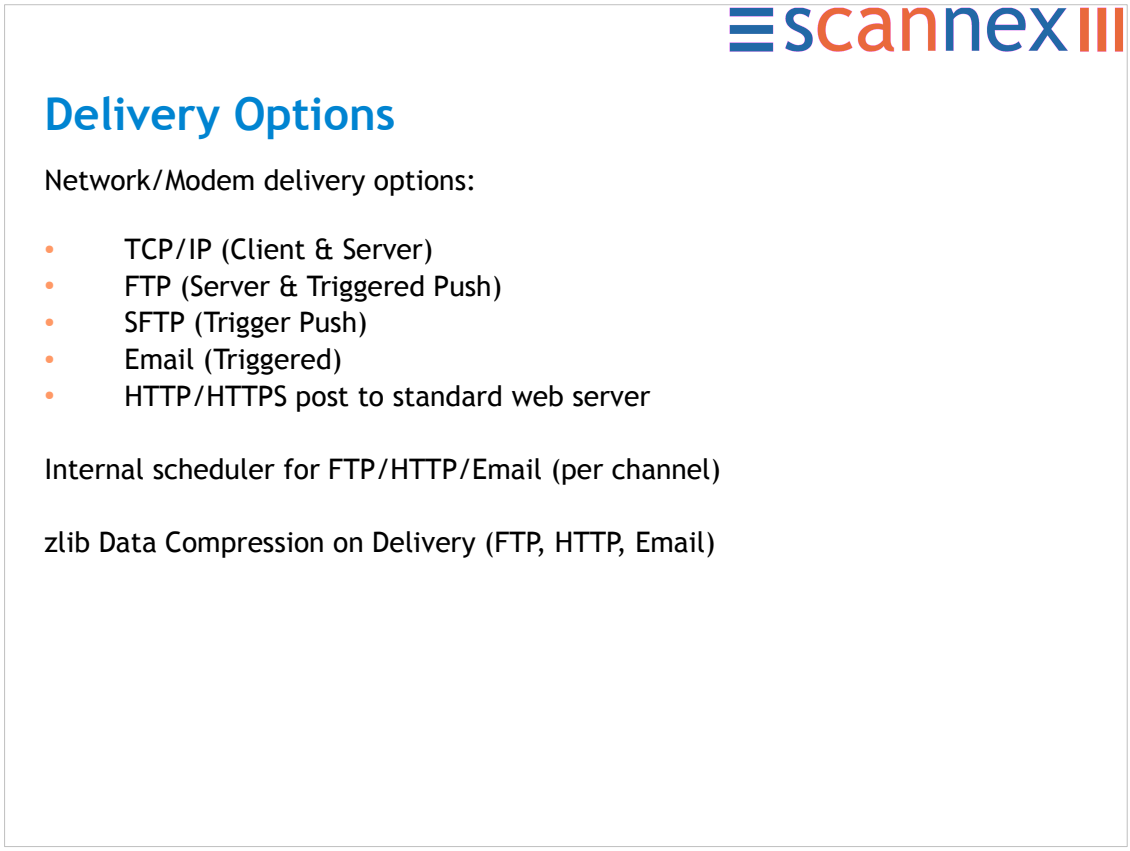
Multi-homing for fixed IP switches

As mentioned, the ip.buffer can collect from a wide range of serial and network connected equipment.

- The COM/serial collection has unique features that make installation a breeze! Even if a PBX engineer comes on site and accidentally changes the baud rate, the ip.buffer will "lock" onto the change and continue collecting data!
- A full range of network protocols are supported – covering network enabled PBXs and VoIP switches.
- Unlike other buffers, the ip.buffer can safely collect binary and ASCII data (so PBXs like the European iSDX can be logged).

Some PBXs require special handling. A few need a "handshake" protocol where the ip.buffer and PBX collaborate to get the data. The standard firmware includes support for the most frequent PBXs, and other PBXs can be supported very quickly (through the Lua scripting).

Multi-homing enables the ip.buffer to "bridge" between logical networks (such as for the Siemens HiPath) without requiring extra equipment.



Many delivery options are available. You can choose the option that best suits your central software.

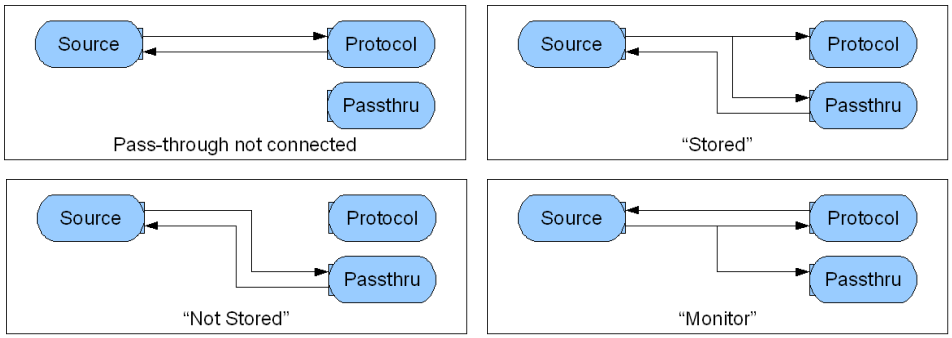
Some delivery methods are more suited for “managed service” applications. For example, the new “HTTP/HTTPS” web posting method makes it easier for IT departments when deploying inside client offices.

All delivery methods can be routed across the network, the public Internet, or by modem. When security is an issue, all ip.buffers include high strength SSL/TLS encryption (more on this later).

The ip.buffer includes optional, lossless data compression. Typically gives around 10:1 ratio on CDR data. Reduces bandwidth and time online.

scannex III

Pass-Through for Moves & Changes



Each channel includes a "Pass-Through" section that provides full access for diagnostic monitoring, secure remote connection, or remote moves-and-changes operations. The pass-through is a TCP/IP server socket – the port number can be configured, and SSL security can optionally be used.

The diagrams show the options available:

- The "**Stored**" mode continues to collect data even when you are talking to the PBX. For example, the Meridian could be programmed to output CDR/Traffic/Alarm information while you are performing moves-and-changes.
- "**Not Stored**" gives a exclusive, bidirectional access to the PBX when you are connected to the pass-through.
- "**Monitor**" is useful for "peeking" at the data without interfering with the collection.

Scripting

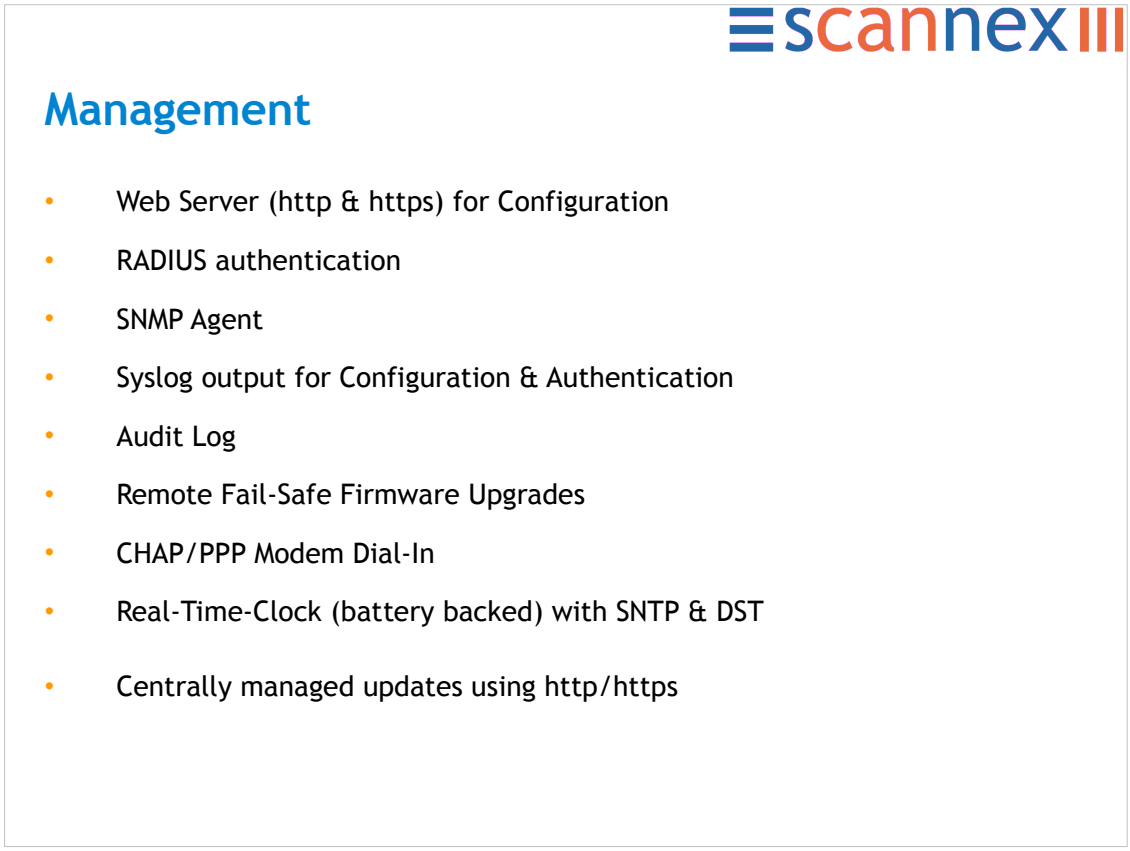
- Scripted PBX Protocols
- Scripted Record Processor e.g.
  - Alarm and Fraud detection
  - Record Filtering and Modification
- Scripted emulation of legacy buffers

The Lua scripting language has been used throughout the ip.buffer. It provides a very flexible way of configuring and extending its functionality.

All PBX protocols are scripted in Lua. Many are included as part of the firmware, but others are made available online by Scannex. New PBXs can be supported very quickly without firmware changes!

Many applications require dynamic analysis of the data – e.g. looking for “911” emergency calls. The Lua scripting language provides a powerful and easy way to examine incoming data and produces alerts and traps.

However, you can also modify and process data. For example, some countries require dialled digits to be masked (as part of their privacy laws). Again, this can be done with Lua scripting – without firmware changes!



The ip.buffer was designed to be safely deployed in complex networks.

- The ip.buffer's **web server** is used for easy configuration and diagnosis of problems.
- **RADIUS authentication** defers password checking to a central company repository.
- The **SNMP agent** allows the ip.buffer to be queried by automated network inventory software.
- The ip.buffer can output **syslog** messages for authentication events – allowing a company to keep “forensic” logs.
- The ip.buffer also includes a detailed **audit log** (which can be emailed or web-posted) – again useful for forensics.
- All **firmware upgrades** are totally fail-safe. Even if the power fails during an upgrade process, the ip.buffer will reboot with the last working firmware!
- **Modem** dial-in accesses are authenticated using **CHAP**, rather than simple password.
- The **RTC** remains accurate when synchronised using SNTP. Full international daylight saving time adjustment is supported.

Security

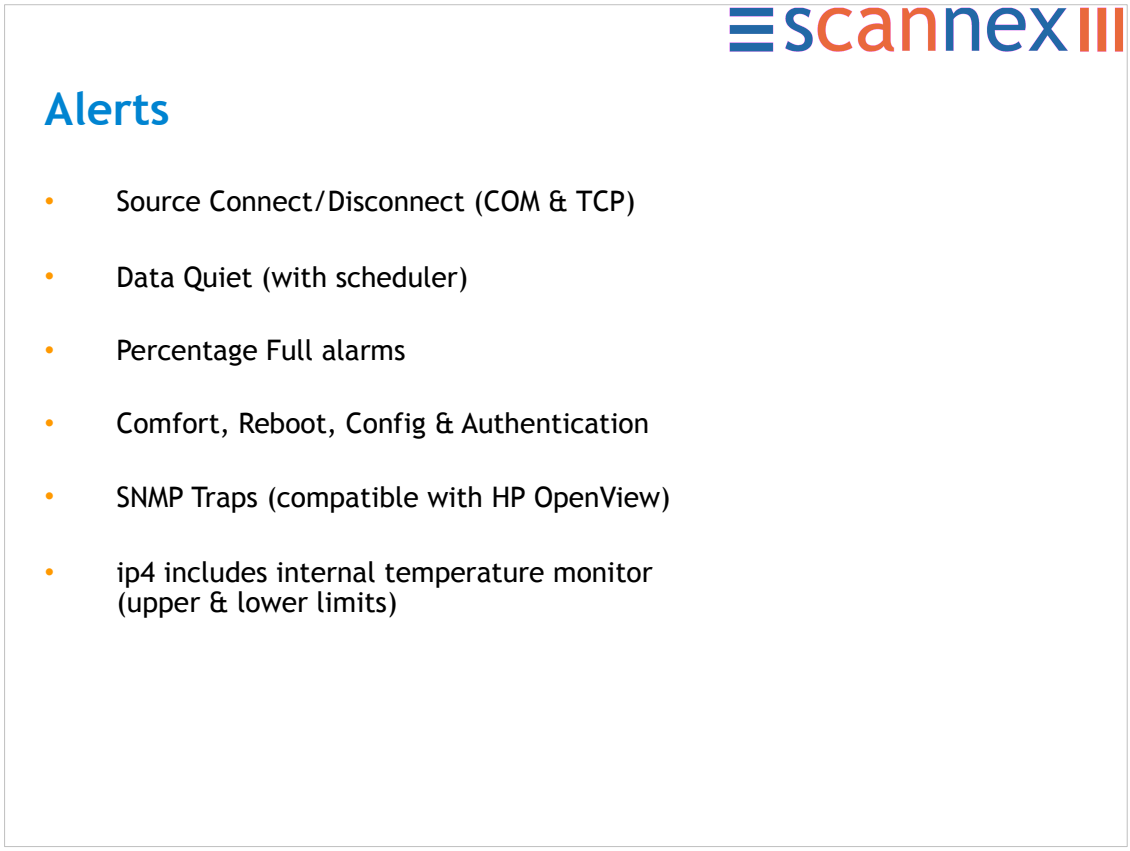
- TLS/SSL Encrypted, AES-256, Connections for all delivery methods
- TLS/SSL option for web server (https)
- SFTP over SSH secure push
- Certificate generation

The ip.buffer is shipped with regular non-SSL firmware. This is to satisfy complex export/import restrictions of many countries. The SSL enabled firmware is freely downloadable from our UK web-server.

The TLS/SSL & SFTP/SSH connections make use of high strength AES-256 encryption – as used by many governments and banks.

All delivery methods can be configured to use TLS/SSL. Standard tools are available to support this at the PC end. Scannex have information and documentation on many industry standard servers and applications.

The ip.buffer has the ability to generate SSL/RSA certificates internally, or certificates can be loaded directly into the ip.buffer. Security conscious organisations can make use of their own certificate chain of trust.



The ip.buffer was designed to be “pro-active” and output useful alerts and messages about the system. These alerts can be sent by email, or by web-post, and can also be sent via SNMP traps.

The COM ports on the ip.buffer include proprietary electronics to monitor the state of the pins – so disconnect alerts can be sent immediately (even if no data is being transmitted)! So, if the PBX powers off, or someone disconnects the data cable the ip.buffer can send an alert.

The ip.4 features temperature monitor alarms.

Modem

- 33.6k Global POTS/PSTN Modem
  - uses TCP/IP protocols over PPP
  - Legacy support for “dumb” modem dial-in
- Quad Band GPRS Cellular Modem
  (including 'nailed-up' connection option)
- Dial out to ISP or direct to RAS Server
- Option for Fallback to modem when LAN unavailable
- Dial-in for Collection & Administration with fixed or auto IP
- Pass-Through available over modem

When the internal global modem is fitted, the buffer uses TCP/IP over PPP which allows you access to all features of the ip.buffer over a single modem link!

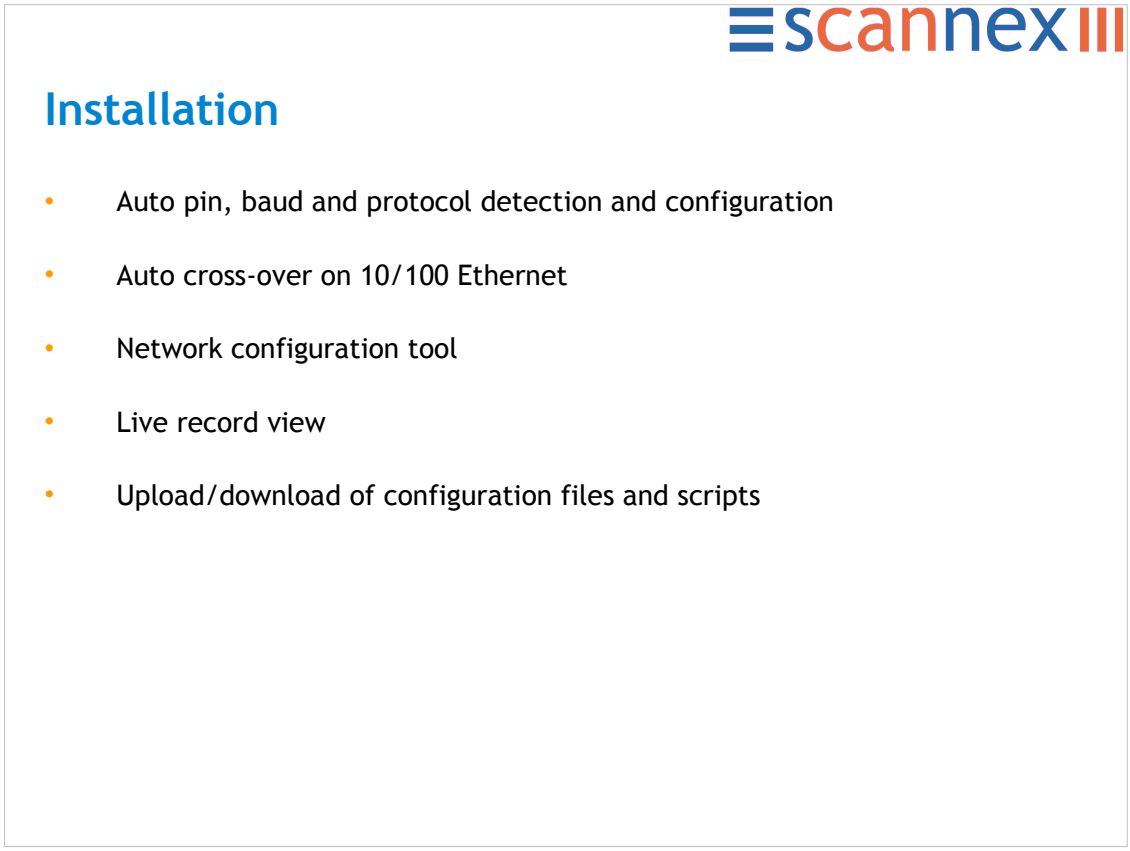
The quad-band GSM/GPRS modem provides wireless connection to the Internet and your servers. You can also dial into the ip.buffer from your PC over the cellular network for management.

When used for dial-out, the ip.buffer can be programmed to connect to a local ISP, or via GPRS, and deliver the alerts and data. Private RAS servers are also supported.

If a high service level is required, the data delivery can be set to deliver across the LAN/WAN and if that fails, dial out and deliver across the Internet.

Scannex have assisted companies in establishing reliable solutions, and provided programming assistance for PPP access.

The ip.buffer includes proprietary technology that allows for dynamic IP assignment when dialling into the ip.buffer. This greatly simplifies deployment!



The ip.buffer was designed to simplify installation:

- Serial ports only need a “pin-to-pin” cable and will detect pin outs, baud rates and protocol automatically!
- The 10/100 Ethernet connection also supports auto cross over (Auto-MDIX)
- Scannex provide a free, small utility (called SEDiscover) that will locate any ip.buffers on the physical network and allow configuration – even if they are not on the same logical subnet!
- One of the web pages of the ip.buffer shows a live view of the data as it arrives – giving the confidence that the data is correct!
- All scripts and configurations are easily backed up and cloned between buffers.

General

- 2 hour Battery backup (batteries not supplied)
- Kit includes all cables, adaptors and PSU
- ip4 only: isolated -48VDC supply option
- Rack mount kit

Batteries are not required to maintain the memory (data is stored in non-volatile flash memory). However, standard AA size NiMH batteries can be fitted internally to provide at least 2 hours of full operation in the event of a power failure!

The ip.buffer kit includes everything you need – just unpack, plug-in, and start collecting and delivering data!

The ip.4 also includes an optional isolated -48VDC supply operation (this option is manufactured to order). It also has a rack mount kit to fit in a 1U bay of a 19” rack cabinet (the rack mount kit is supplied as standard in the kit box).

Documentation

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Scannex have a philosophy of openness of information. User manuals, guides and other information is freely available from our web-site.

We also pride ourselves in our level of customer support – providing suggestions and recommendations for software and solutions as well.