

**BRIDGE**  **TECHNOLOGIES™**



SAFEGUARDING OVER  
**900 MILLION** SUBSCRIBERS

POWERFUL  
**MONITORING & ANALYSIS**  
SOLUTIONS

DEPLOYED IN OVER  
**94 COUNTRIES**



MORE THAN  
**20 000 CHANNELS**  
PROTECTED

**800+**  
**INSTALLATIONS**  
WORLDWIDE





# Monitoring - Benefits & Results

- Ability to foresee, identify and solve impending and actual problems
- Understand the behaviour and performance of your media system
- Highly efficient troubleshooting
- Enable staff to manage new types of technologies
- Control OPEX - and increase profitability
- Maximize customer satisfaction



# Bridge Technologies - Advantages

- Complete solutions for end to end monitoring
- Integrates with existing infrastructure
- Advanced analytics for in depth understanding
- Recognise historical behaviours, identify a pattern over time
- Diagnostic tools for anticipating problems before they happen
- Intuitive visual interface
- Reduces the requirement for dedicated staff



The image features a sunset or sunrise scene with a colorful sky in shades of orange, yellow, and blue. In the foreground, the silhouettes of two people are visible; one person is pointing towards the other's head. To the right, there is a silhouette of a bar chart with four bars of increasing height. The text "Total QoE with QoS" is centered in white.

Total QoE with QoS



# Design Advantages

- Combined QoE, QoS and Redundancy solutions
- Modular flexibility on hardware probes
- Virtualised software probes
- Distributed probe philosophy - end to end
- Scalable through license upgrade
- Third party support with open data extraction

A large, stylized green graphic consisting of two curved, overlapping shapes that form a partial 'X' or a checkmark-like symbol, positioned behind the title.

# QoE - Content Quality

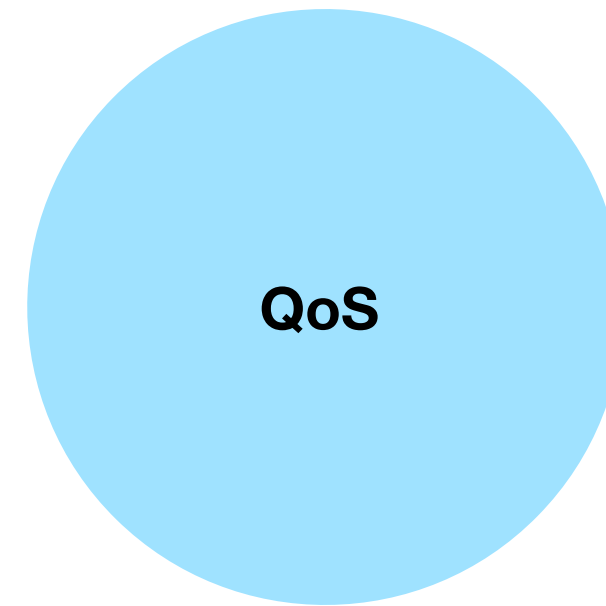
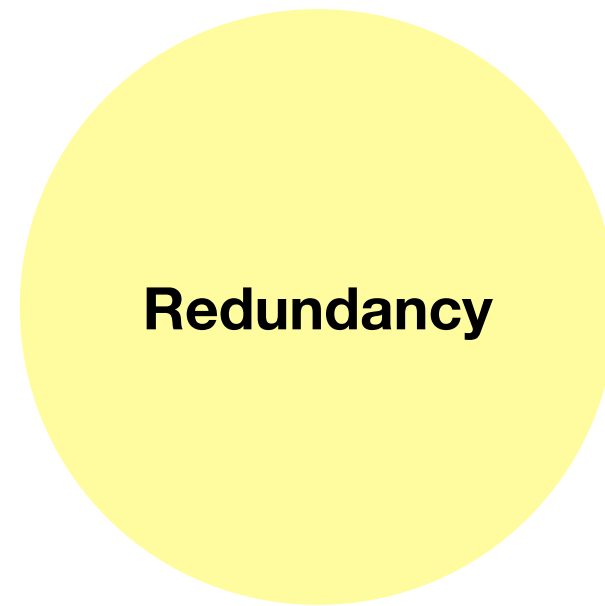
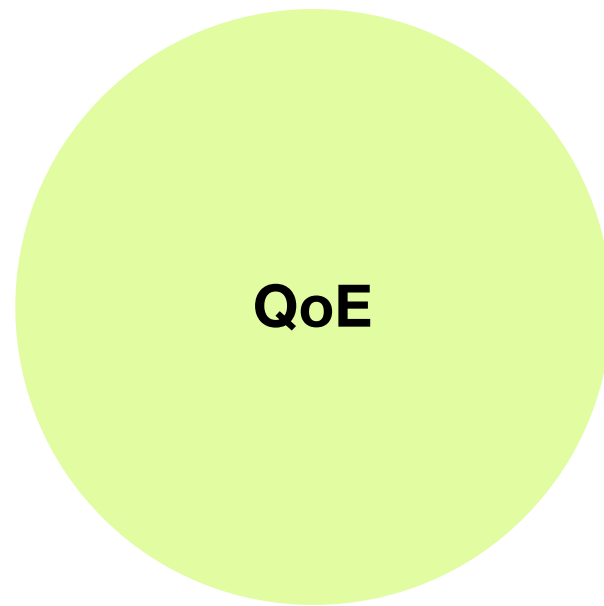
- Produces hard, empirical QoE data without the false positives
- Objective video and audio monitoring of MPEG-2, h.264/MPEG-4 and h.265/HEVC streams
- Monitors services objectively at the point of transmission
- Unique web browser based remote video wall
- Visual status anywhere
- Software/Hardware based solution
- Thumbnail and metadata extraction and content alarming

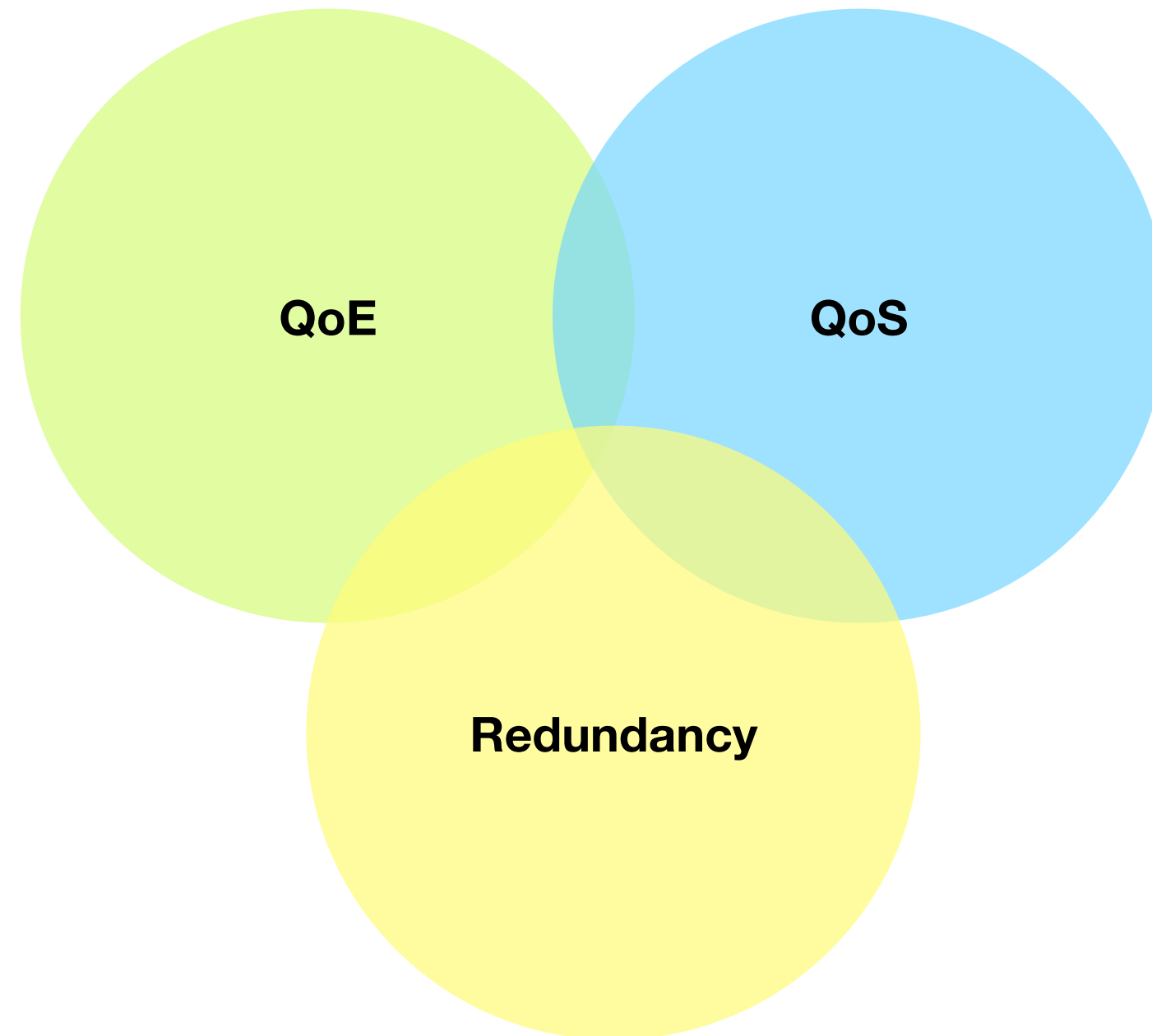


# QoS - Service Quality

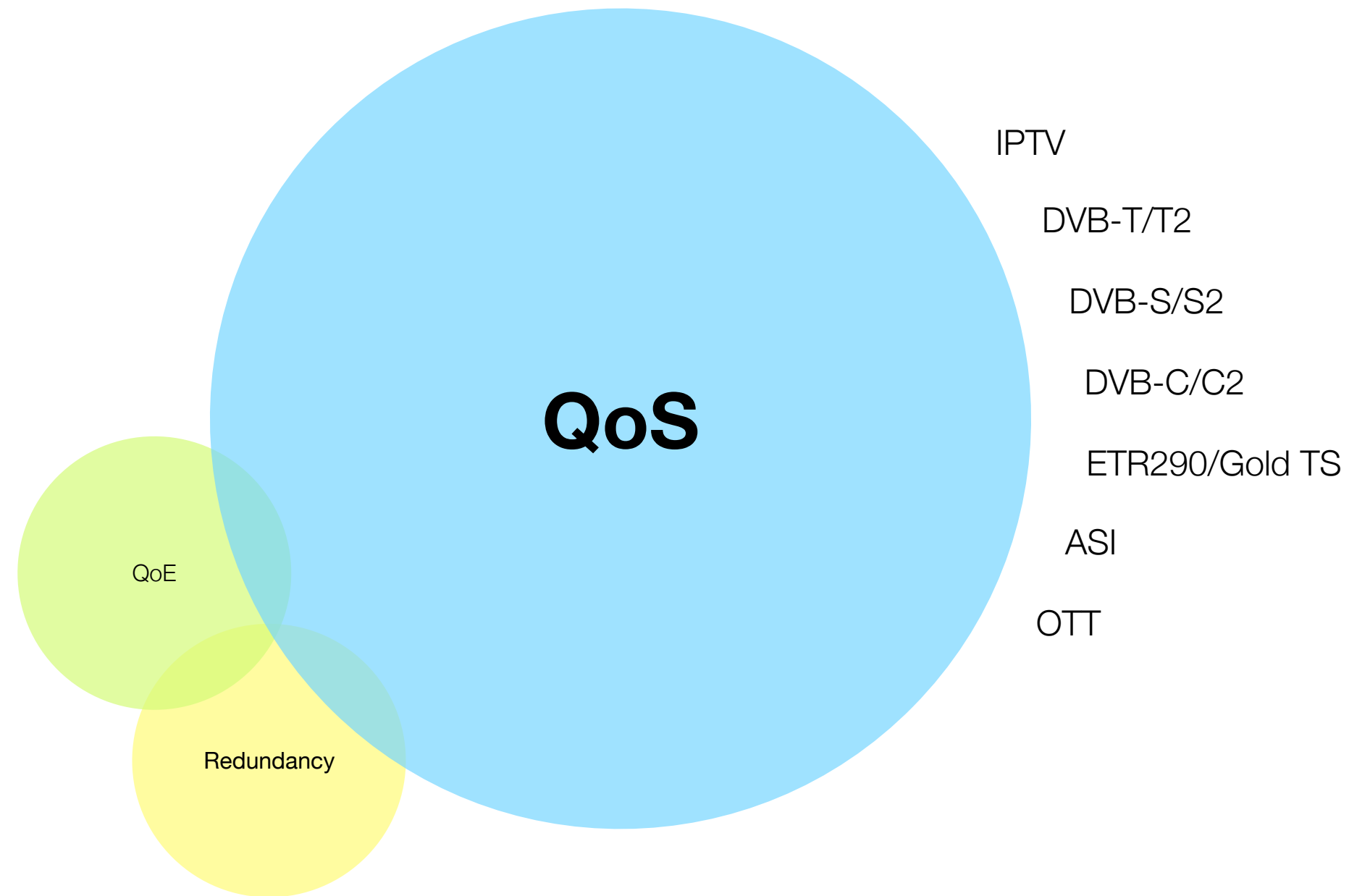
- Detailed data and visuals for Error, Jitter, Dropped packets, Latency and low throughput analysis
- Visual at-a-glance monitoring in the NOC, VOC, head-end or remotely via any standard web browser
- Condensed mosaic data view of all services monitored
- Data correlation, historical and real time understanding
- Alarming for up to 100 TV multicast streams/OTT concurrently
- PDF Reports for easy system performance analysis by management/engineering staff











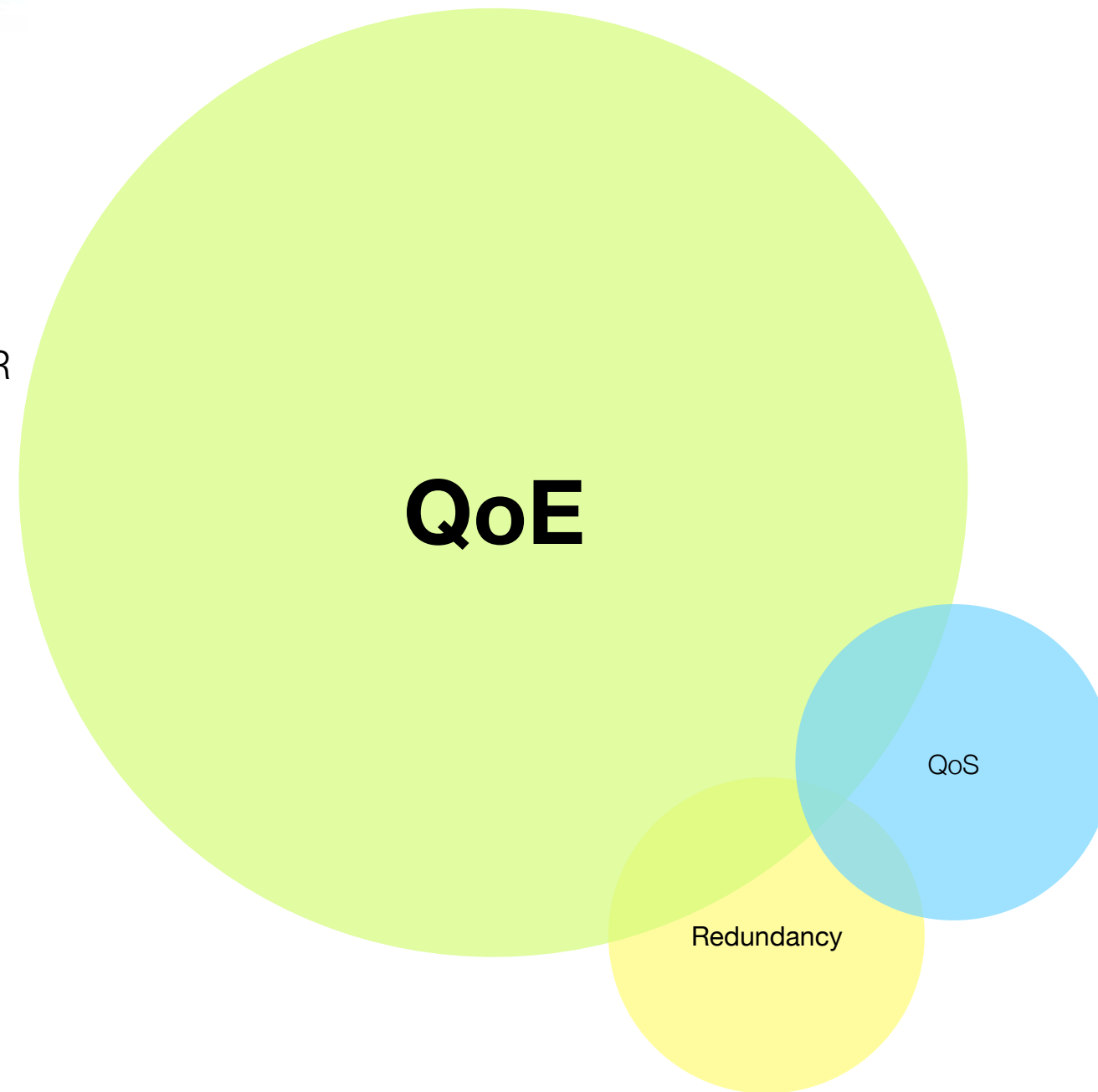


VB288 CONTENT EXTRACTOR

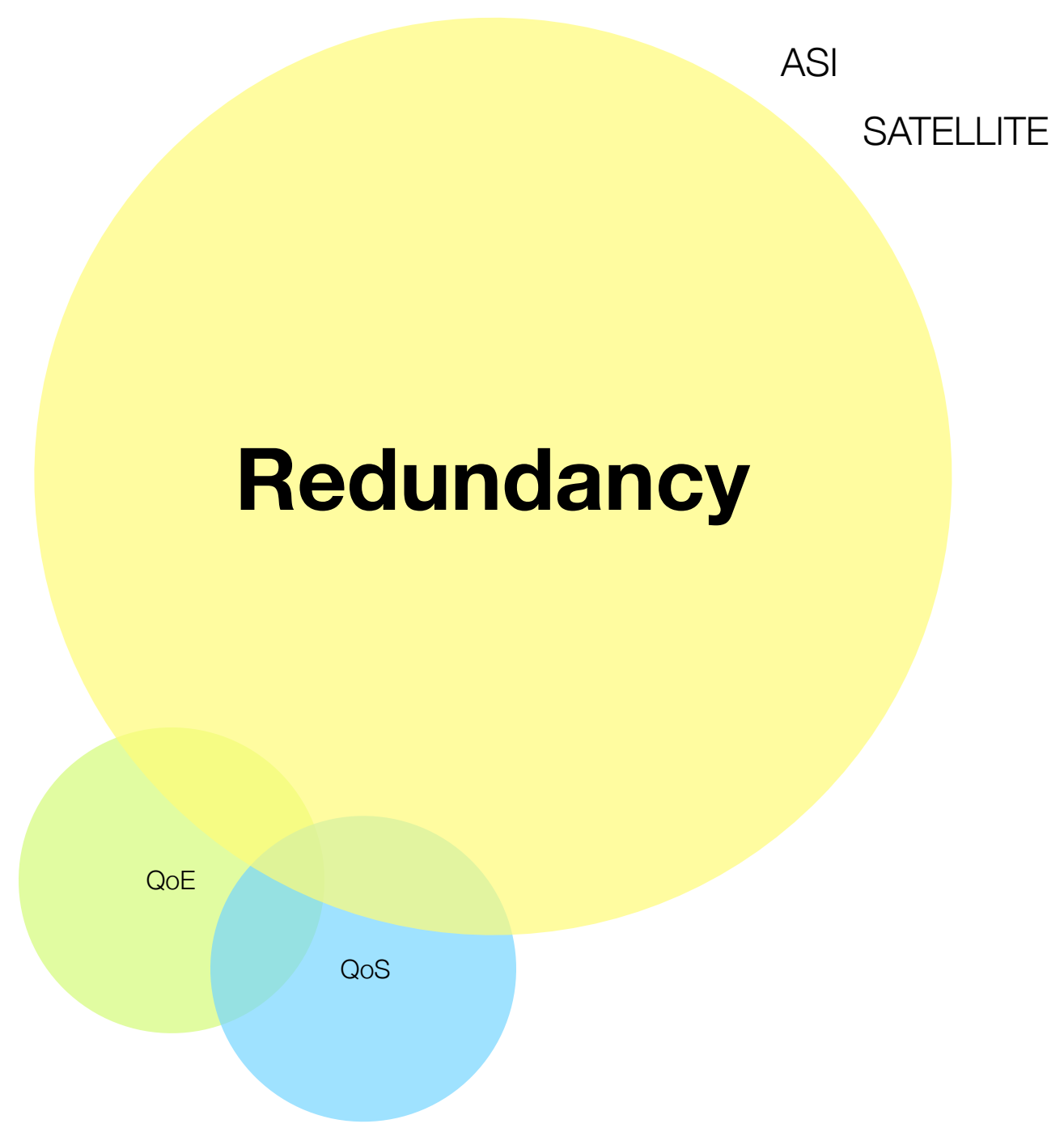
IPTV/OTT

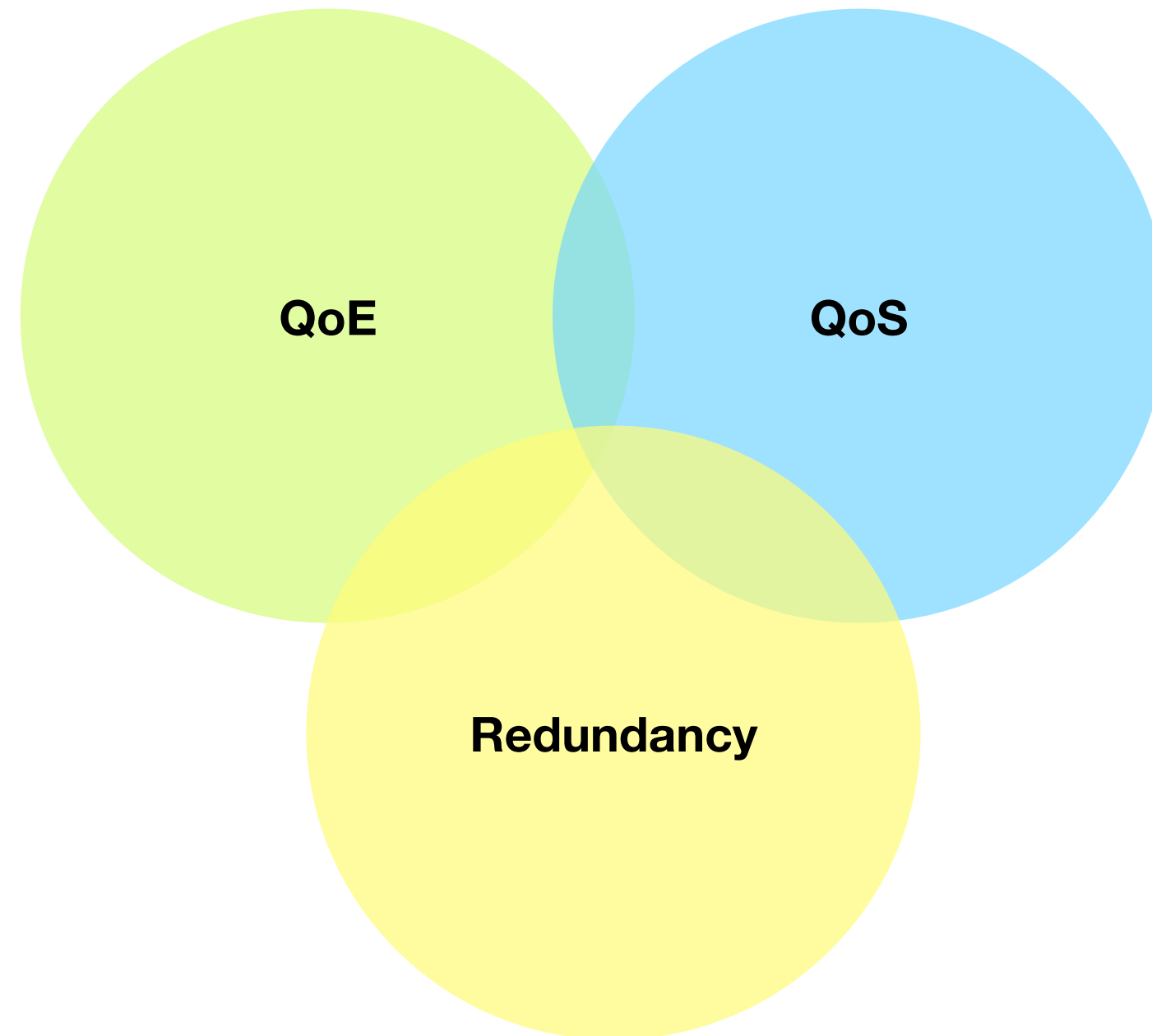
Gold TS

VIRTUAL





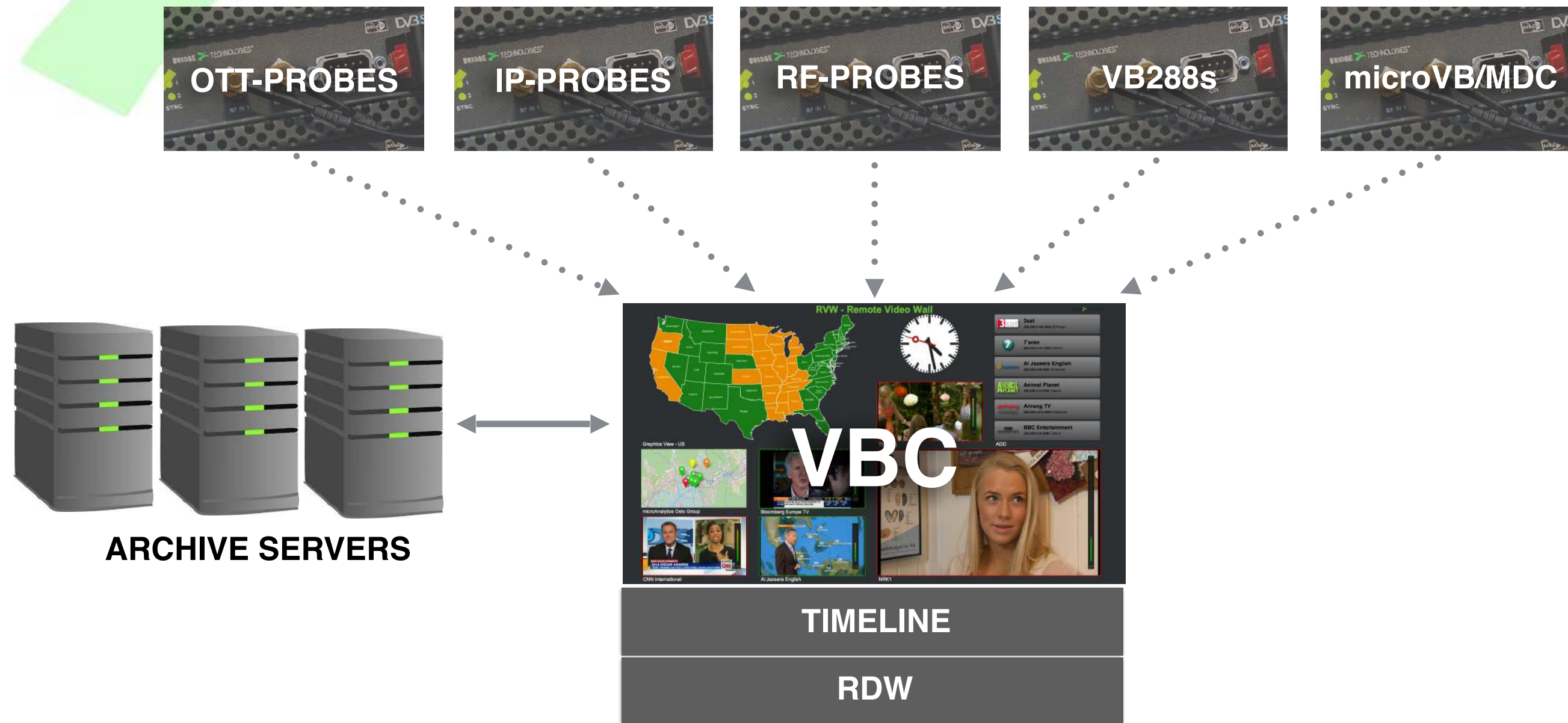






# VBC Server & Data Visualisation

# VBC data model





# Archive Server

# Scalable database design

## Probes/Extractors

- Produces data



## Archive Server

- Receives probe data
- Stores based on VBC config

[illegible]

## VBC

- Configures the archive server
- Timeline GUI







# Products & Solutions



# Product and Solutions

## MEDIA PROBES

- VB1 SERIES: VB120
- VB2 SERIES: VB220 & VB220-SW
- VB3 SERIES: VB330 & VB330-SW
- VB440-SW
- RF INTERFACES: VB242, VB252, VB256, VB262, VB266, VB272
- microVB™
- NOMAD
- PocketProbe
- VB288 OBJECTIVE QoE EXTRACTOR
- VBC SERVER

## INTELLIGENT REDUNDANCY

- VB273 SATELLITE SWITCH
- VB243 ASI SWITCH

## SERVICES

- SYSTEM OPTIMIZATION
- SOFTWARE MAINTENANCE
- AUTOMATIC SW DOWNLOAD

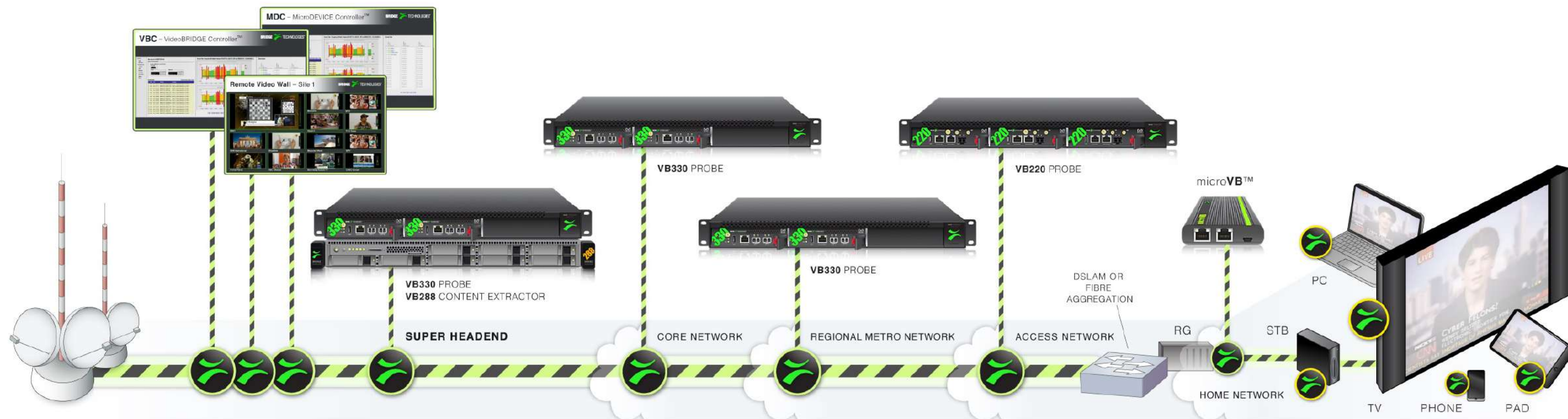
# Solutions at a glance

- 1) IP Monitor Probes
- 2) Satellite Ingress Monitoring
- 3) Terrestrial Distribution
- 4) Broadband Cable
- 5) Objective QoE Content Monitoring
- 6) OTT Architectures
- 7) Intelligent Redundancy
- 8) Home Network
- 9) Virtual Environments
- 10) VBC Server & Data Visualisation

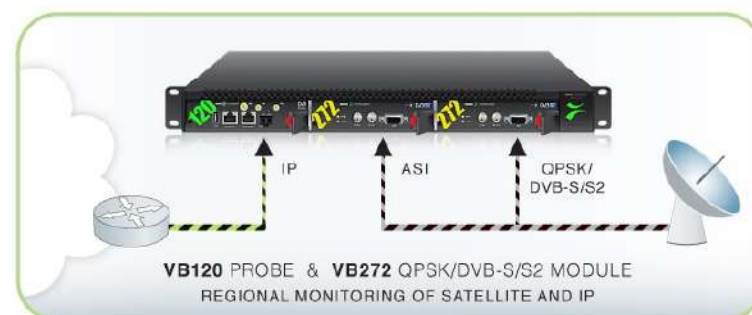
Software,  
Hardware &  
Virtual Probes







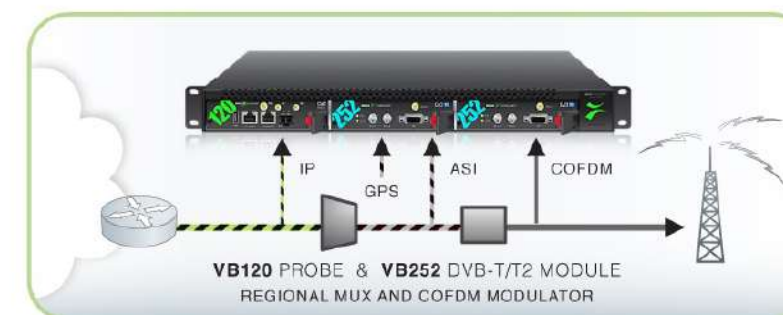
## DIGITAL SATELLITE







## CABLE DISTRIBUTION







## DIGITAL TERRESTRIAL



# Chassis Options

			
<b>DC CHASSIS</b>  SINGLE AC POWER SIDEWAYS AIRFLOW FRONT 48V CONNECTOR	<b>AC CHASSIS</b>  SINGLE DC POWER SIDEWAYS AIRFLOW FRONT IEC CONNECTOR	<b>EC - ENHANCED CHASSIS</b>  DUAL REDUNDANT AC POWER SUPPLIES FRONT-BACK AIRFLOW SOFTWARE CONTROLLED FANS BACK DUAL IEC POWER CONNECTOR 9PIN GPI RELAY CONNECTOR FIELD CHANGEABLE FAN TRAYS STATUS LEDs FRONT AND BACK	<b>ED-DC - ENHANCED CHASSIS</b>  DUAL REDUNDANT DC POWER SUPPLIES FRONT-BACK AIRFLOW SOFTWARE CONTROLLED FANS BACK DUAL IEC POWER CONNECTOR 9PIN GPI RELAY CONNECTOR FIELD CHANGEABLE FAN TRAYS STATUS LEDs FRONT AND BACK

# Modular Blade Interfaces for VB120/VB220

 <p><b>VB252 DVB-T/T2 RF INTERFACE</b></p>	 <p><b>VB262 DVB-C QAM RF INTERFACE</b></p>	 <p><b>VB272 DVB-S/S2 RF INTERFACE</b></p>	 <p><b>VB242 SWITCHED ASI INTERFACE</b></p>
<p>COFDM RF INPUTS SFN DRIFT ALARMING WITH EXT.CLOCK PACKET ERROR RATE PRE/POST BHC BER AND MER BUILT IN GPI INTERFACE</p>	<p>QAM AND 8/16VSB RF INPUTS ANNEX A, B AND C GRAPHIC CONSTELLATION DIAGRAM ANALOGUE RF SIGNAL ALARMING PRE/POST FEC BER MER AND SNR BUILT IN GPI INTERFACE</p>	<p>QPSK, 8PSK, 16PSK AND 32PSK ANALOGUE RF SIGNAL ALARMING GRAPHIC CONSTELLATION DIAGRAM DISEqC v1.2 RF SWITCH CONTROL BUILT IN GPI INTERFACE</p>	<p>ROUND ROBIN ASI SWITCH OR DUAL INPUT INTERFACE WITH FULL DVB AND ATSC SUPPORT</p>
<p><b>SECOND RF INPUT OPTION</b> Enables the second RF input for higher density monitoring and analysis.</p>	<p><b>SECOND RF INPUT OPTION</b> Enables the second RF input for higher density monitoring and analysis.</p>	<p><b>SECOND RF INPUT OPTION</b> Enables the second RF input for higher density monitoring and analysis.</p>	
<p><b>ADVANCED-RF OPTION</b> Enables advanced RF features like Impulse Response graphing with transmitter drift alarming.</p>	<p><b>ADVANCED-RF OPTION</b> Enables advanced RF features like Spectrum Analysis graphs.</p>		



# Series 1 Rack-Mount Broadcast Probe

- Blade form-factor for 19" 1RU chassis use
- EC chassis with redundant AC PSUS, AC single PSU or DC 48v chassis options
- Optional IP monitoring and analysis
- Full ETR290 analysis and monitoring
- MediaWindow™ visualisation technology
- Line speed ASI analysis
- Full DVB and ATSC compliance
- Full PSI/SI and PSIP table decoding
- Eii built-in
- Controller for RF interfaces





# Series 2 Advanced Rack-Mount Probe

- Both hardware & software based probe
- Blade form-factor for 19" 1RU chassis use
- EC chassis with redundant AC PSUS, AC single PSU or DC 48v chassis options
- Concurrent monitoring of 260 channels
- IP "sniffer" with detailed protocol overview
- Optional full ETR290 analysis and monitoring
- MediaWindow™ visualisation technology
- Line speed GigE analysis
- IGMP logging and tracing
- Full DVB and ATSC compliance
- Controller for RF interfaces
- Eii built-in
- Ericsson Mediaroom support



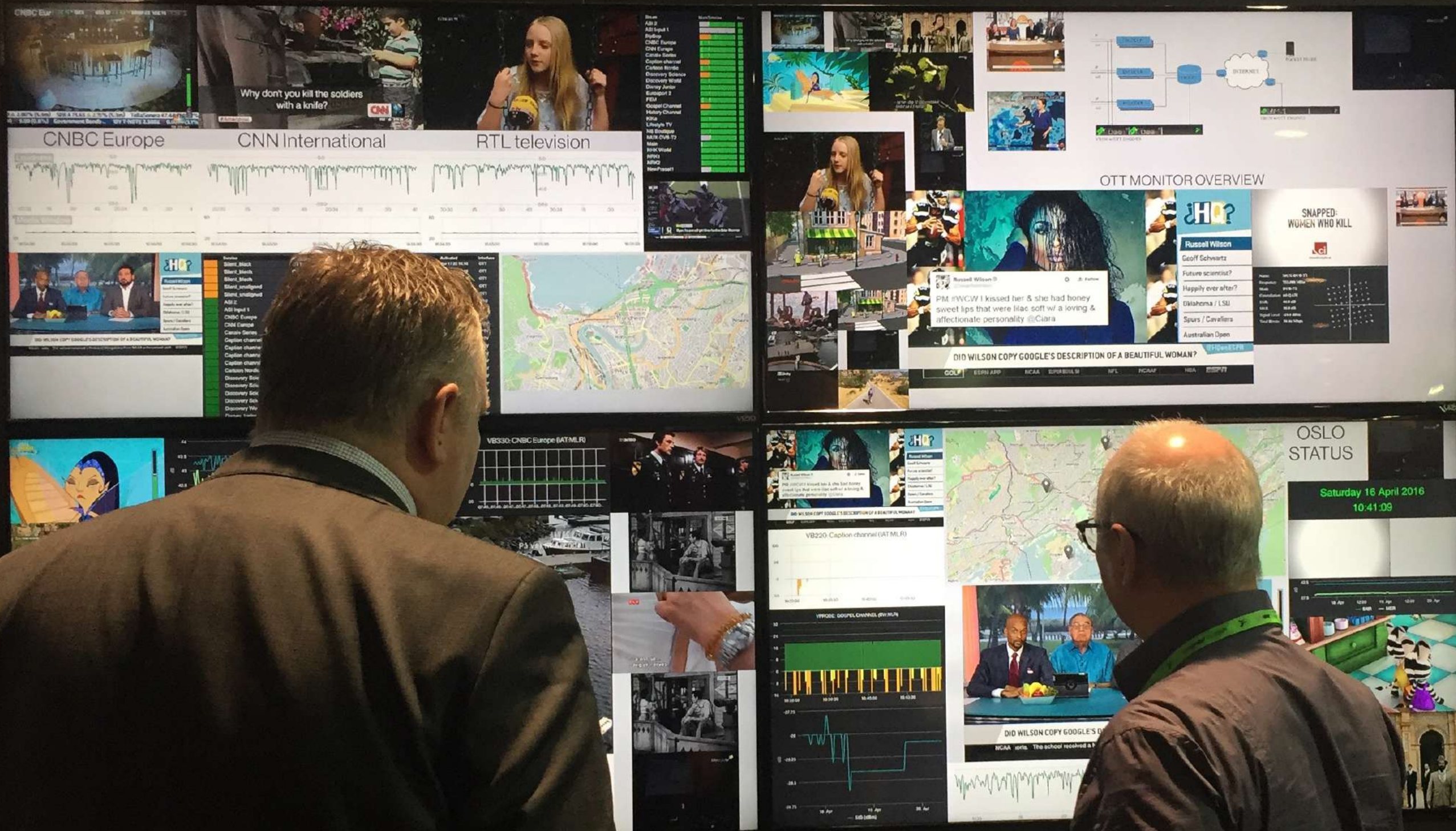
# Series 3 Advanced 10G Probe

- Both hardware & software based probe
- Blade form-factor for 19" 1RU chassis use
- EC chassis with redundant AC PSUS
- Concurrent monitoring of thousands of channels
- IP "sniffer" with detailed protocol overview
- MediaWindow™ visualisation technology
- Dual 10G interfaces
- IGMP logging and tracing
- Eii built-in
- Ericsson Mediaroom support





# RDW - REMOTE DATA WALL



## CUSTOMIZABLE 'FLIGHT DECK' OF DATA INSTRUMENTS (NEW)

- Rich graphical data wall display from diverse sources of data
- Screen based configuration paradigm, multiple TVs or computer screens
- html5 based, no special hardware required
- Mix services from multiple VB288s on same RDW
- Multi-Browser linking
- Adaptable notification modes
- Easy and elegant control plane application

## WIDGETS (NEW)

- Event countdown, clock and text messages, selectable fonts, size, colouring
- Full-motion video with optional status frame, audio bars, location and alarms
- CC widge for overlay on thumbnail, selectable single/multi-line, no thumb and multi-language
- Dynamic Alarm Timeline, locations and services, ETR290 mode
- Maps, pre-scaling and dynamic alarm mode (auto scaling to location)
- 3rd party display widgets:
- Appear TV
- Skyline DataMiner
- Ericsson nCompass

**dataminer**





# RDW - Remote Data Wall

## CUSTOMIZABLE 'FLIGHT DECK' OF DATA INSTRUMENTS

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# RDW - Remote Data Wall

## Widgets

- Event countdown, clock and text messages, selectable fonts, size, colouring
- Full-motion video with optional status frame, audio bars, location and alarms
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- 3rd party display widgets:
  - Skyline DataMiner





# VB288 Content Extractor



# VB288 Content Extractor

- MPEG-2 (H.262), H.264/AVC and H.265/HEVC thumb nailing for multicasts, HLS and HDS feeds
- Blackframe, Freezeframe, audio alarming, resolution discrepancies
- Image analysis: Freeze, OTT profile alignment
- Real-time loudness monitoring



# VB288 Content Extractor

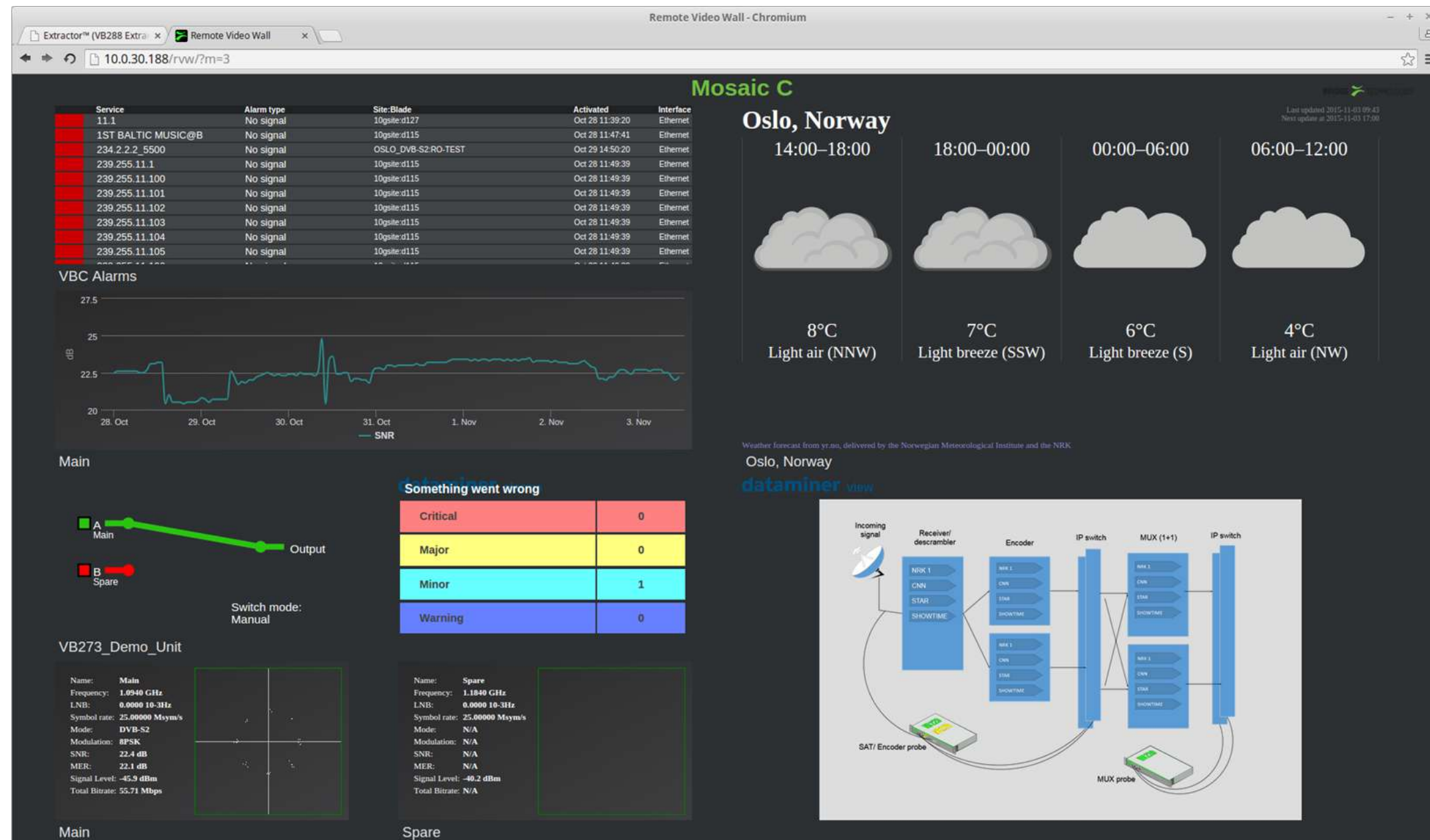
- Web-based Remote Video Wall





# VB288 Content Extractor

- Widgets and VBC graphics



# RF Interfaces

# Blade Interfaces: DVB-T/T2 CODFM Digital Terrestrial

- Interface card for 120 or 220 blades
- Full DVB-T/T2 compliance
- SFN transmitter monitoring with external GPS clock lock
- Optional dual RF inputs
- Packet error rate, signal level, snr, pre/post bhc ber and mer
- Configurable round-robin
- Built-in GPI interface



# Blade Interfaces: DVB-C QAM/VSB Digital Cable

- Interface card for 120 or 220 blades
- Full QAM and VSB compliance
- Annex a, b and c
- Optional dual RF inputs
- Optional analogue spectrum analysis
- Configurable round-robin
- Built-in GPI interface





# Blade Interfaces: DVB-S/S2 Satellite Interface

- Interface card for 120 or 220 blades
- Round robin tuning
- Full DVB-S and DVB-S2 compliance
- Analogue RF alarming
- Built-in GPI interface
- DISEqC v1.2 switch control



# Blade Interfaces: ASI Switched Dual Input

- Interface card for 120 or 220 blades
- Round robin ASI switching or dual input
- Full DVB and ATSC compliance



The image features two silhouetted figures, a man and a woman, standing against a vibrant sunset sky. The man, on the left, is pointing towards the woman's head. The woman, on the right, is holding a briefcase. In the foreground, a bar chart with four bars of increasing height is visible. The text "Micro Analytics" is centered over the image.

# Micro Analytics

# Home Network Remote Analysis: microVB™



- microVB™ and MDC
- Breakthrough price-performance
- Deep and detailed packet analysis
- Extensive OTT packet flow reporting
- Removes truck-rolls as costly OPEX
- Generates plentiful statistics
- Full Ericsson Mediaroom support
- Full visualisation of home-network performance
- Data correlation with existing probes





# Virtual Environments



# VB330-V Virtual IP Probe

- Feature parity to hardware VB330
- Designed for data centres and headends
- Scale up and reconfigure capacity at very short notice
- Assists media organisations competing for territory with new audiences and new markets
- OTT Engine option w/HLS, HDS, Smooth Streaming, MPEG-DASH and RTMP
- ETR290 Engine Option w/ Gold TS Protection
- FEC analysis, Time-Loss-Distance, TOS, ICMP analysis
- Video IP multicast, video OTT/ABR streaming, video-on-demand unicast, PCAP recording and general traffic protocol inspection



# VB440-SW Probe

- Dual 40G ports
- Option equality, license equality to VB330-V
- SDIoIP with 2022.6, 2022.7 and IEEE4175
- Designed for data centres and headends
- Scale up and reconfigure capacity at very short notice
- Install on Intel server
- VMWare and OpenStack friendly
- Eii for provisioning from 3rd party systems







OTT Architectures

# OTT Option Range

- **VB330 10G probe** - thousands of streams and a multitude of technologies in real-time and in parallel
- **VB220 1G probe** - high volume digital video across an IP-based infrastructure
- **VB120 1G probe** - monitoring IP unicasts and multicasts, OTT/ABR streams and RF formats



# OTT Engine Technology



- The OTT Engine enables providers to have real active monitoring of ALL channels provided, both for LIVE content and selected VoD streams
- Tests all profiles inside a particular channel
- Each engine can deal with up to 10 channels
- OTT monitoring of up to 50 TV services/profiles (5 OTT engines)
- OTT/ABR support for microsoft Smoothstream™, Apple HLS™, Adobe HDS™, RTMP and MPEG DASH
- Thumbnail and audio bars support for unencrypted HLS and HDS formatted streams
- VB330/VB330-V 10G probe the number of engines is 25 or 50 (BULK OTT)



# PocketProbe

- Enables operator to monitor OTT after the 3G/4G network or after WiFi network
- Automatic Round-robin testing of all channels without user intervention
- Point PocketProbe towards VBC and it is detected in Equipment view of VBC
- PocketProbe forwards alarms per OTT channel to the VBC



**VBC Controller** BRIDGE TECHNOLOGIES

	Last96h	Now	I.F.	Stream	#	Last96h	Now	I.F.	Stream	#
LIVE										
MONITORING	1		Ethernet	BBC_WORLD_NEWS	2	15				
BLADE ALARMS	2		PP-OTT	New channel	2	16				
GRAPHICS VIEW	3		PP-OTT	New channel 2	1	17				
STREAM VIEW	4		PP-OTT	New channel2	1	18				
SELECTED	5		Ethernet	SKY_NEWS_INT	1	19				
THUMBS VIEW	6		Extractor	SKY_NEWS_INT	1	20				
SERVICE VIEW	7					21				
RDP	8					22				
EQUIPMENT	9					23				
ALARM SETUP	10					24				
REPORTS	11					25				
EXT. REPORTS	12					26				
MAIN	13					27				
	14					28				

Stream-group [All streams] Sort Name Filter new

1: 29: 57: 85: 113: 141: 169: 197: 225: 253: 281: 309: 337: 365: 393: 421: 449: 477: 505: 533: 561: 589: 617: 645: 673: 701: 729: 757: 785: 813: 841: 869: 897: 925: 953: 972: 2856 84 112140 168 196 224 252 280 308 336 364 392 420 448 476 504 532 560 588 616 644 672 700 728 756 784 812 840 868 896 924 952 980 999

Sep 10 12:35:31

```
491 if (avctx->qblur >= 0)
492     x4->params.rc.f_qblur = avctx->qblur; /* temporally blur quants */
493 if (avctx->qcompress >= 0)
494     x4->params.rc.f_qcompress = avctx->qcompress; /* 0.0 => cbr, 1.0 => constant qp */
495 if (avctx->refs >= 0)
    x4->params.i_frame_reference = avctx->refs;
else if (x4->level) {
    int i;
    mbn = FF_CEIL_RSHIFT(avctx->width, 4) * FF_CEIL_RSHIFT(avctx->height, 4);
    level_id = -1;
    *tail;
    scale = X264_BUILD(129, 7, 38);
    if (strcmp(x4->level, "1b")) {
        level_id = 9;
        if (strlen(x4->level) <= 3) {
            level_id = av_strtod(x4->level, &tail) * 10 + 0.5;
            (*tail);
            level_id = -1;
        }
        if (level_id <= 0)
            avctx, AV_LOG_WARNING, "Failed to parse level\n");
    }
}
```

# OMEGA Ω

“Higher performance from your monitoring system through expert care”



# OMEGA Ω - PROGRAMME

- Bridge Technologies has launched Omega, a personalised expert program designed to empower customers to achieve and maintain higher monitoring performance with their systems
- Higher performance from your monitoring system through expert service
- The Omega program is based around integrated modules for Automated Software Services, Recurring Events and a Dedicated Personal Expert, this to guarantee optimum system performance with superior continuity of knowledge, for engineering staff

## **3 main modules**

- Dedicated Personal Expert Engineer
- Automated Software Services
- Recurring Events



A large, light green abstract graphic consisting of two curved, overlapping shapes that resemble a stylized 'X' or a pair of wings, positioned behind the title.

# OMEGA Ω - PROGRAMME

The full Omega program includes:

- Priority support
  - A dedicated personal expert engineer; a 3-day consultancy to implement the customer's choice of operational tasks; a lab staging area; remote access for updates and diagnosis
  - Webex training and product update sessions; a maps service for dynamic geographical visualisation of the customer's network
  - Automated backups of critical configurations; automated health reports and system health widget; annual on-site workshop with expert engineer
- .....and many other services.

A photograph of a modern multi-story building at night, featuring large glass windows and balconies. The image has a strong green color cast. The word "Technologies" is centered in white text.

# Technologies



# GOLD TS



Gold TS Protection™

- Gold TS Protection is a new technology that makes monitoring for digital services much quicker to set up, and fault-tracking much faster, more accurate and secure. Developed exclusively by Bridge Technologies, Gold TS Protection includes all the checks specified in the ETR290 standard, but goes much further to include testing for critical conditions missed by ETR290.





# MEDIA WINDOW

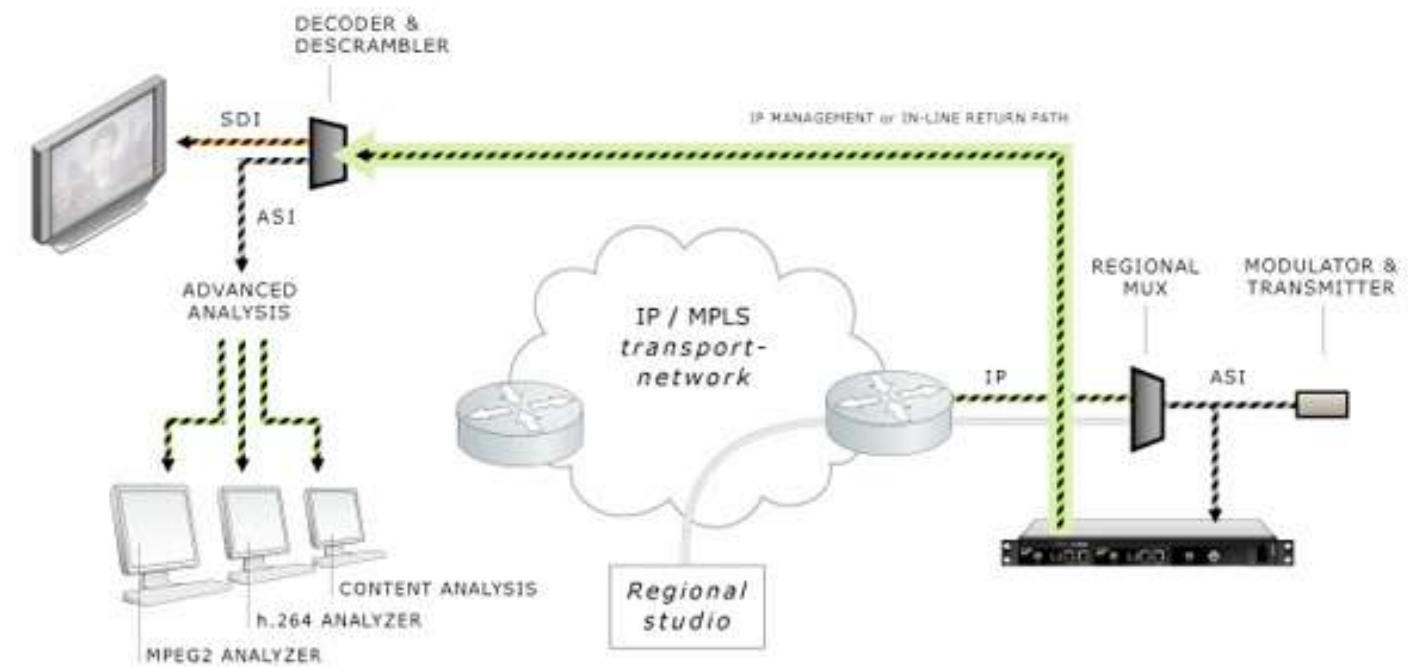


- Patented visualisation technology for media streams and services
- Enables status-at-a-glance of advanced data
- Gives operators UDP packet loss detection and analysis
- RTP analytics capability for all RTP streams
- Built in all bridge technologies probes

# RDP



- Return of any media stream to NOC or Headend
- Return of ASI, QAM, CODFM, VSB or DVB-S/S2 streams
- Service selection from MPTS streams
- SPTS or MPTS alarm triggered recordings
- Download recordings via web interface





# MICROTIMELINE

MICROTIMELINE™

- Unique technology for status-viewing of large number of services
- Gives information on last 4 days of operation (96 hours)
- More than 200 services monitored on a single web page
- Easy visual correlation of multiple services





- Framework for 3rd party integration with the probes
- XML or SNMP
- Extensive documentation
- Real-time measurements
- Highly scalable for thousands of probes
- Multi user
- Full ETR290 monitoring and analysis support
- Example: skyline communications dataminer

# REPORTS








- Part of the VBC
- Enterprise level reporting of SLA and proof-of-carriage compliance
- Advanced proprietary postscript© engine
- Generates pdf reports for on-screen or print use
- From 24 hours up to two years of data
- Individual sites or aggregated channel views
- Advanced trending statistics
- Management reporting or detailed engineering views

# Unique System Technologies

						
<p>External Integration Engine is part of every Probe delivered and contains unprecedented access to all analytics data via an easy to implement xml interface. The xml interface is very well documented and enables any 3rd party to integrate the Probes with minimum effort and time consumption. This gives legacy systems access to all analytics data from the probes.</p>	<p>The MediaWindow™ is a patented technology developed by Bridge Technologies for highly visual understanding of complex packet behavior. By utilising an advanced graphical user interface, real-time packet transports can be viewed and understood from a transport perspective including UDP packet loss.</p>	<p>Full Service Monitoring enables a probe to remotely monitor IP devices like routers, gateways, http servers and all other types of IP devices via ICMP (Ping) and http requests and receive alarming on loss of contact. Typically used to continuously validate core services from different remote network segments.</p>	<p>The ETR290 Engine is part of the VB1 series and options on the VB2 and VB3 series Probes. It contains the full ETSI TR 101 290 analytics framework and additional extensions to the framework with conditional access monitoring and more. To be able to use the ETR290 engines the microETR display engine provides a user friendly status-at-a-glance interface to the large ETR290 dataset</p>	<p>Return Data Path provides the ability to return any signal or service monitored in the remote probe to the HeadEnd or any destination in the network. This enables remote descrambling and decoding of any signal even services from within an MPTS and all services from any RF interface.</p>	<p>The ETR290 Engine is part of the VB1 series and is an option on the VB2 and VB3 series Probes. It contains the full ETSI TR 101 290 analytics framework and extensions to that framework for conditional access monitoring and more. Up to 50 ETR290 Engines can run in parallel on the VB3 series 10G Probe.</p>	<p>For the VBC Server the powerful REPORTS Option enables Enterprise quality automated PDF reports. Daily, weekly, monthly or up to two years of channel data can be generated and eMailed to recipients automatically.</p>
<p><b>STANDARD ON ALL PROBES</b></p>	<p><b>STANDARD ON ALL PROBES</b></p>	<p><b>STANDARD ON VB2 and VB3 SERIES, OPTIONAL ON VB1 SERIES</b></p>	<p><b>STANDARD WITH ALL PROBES WITH ETR290 ENGINES</b></p>	<p><b>STANDARD ON ALL PROBES</b></p>	<p><b>STANDARD ON VB1 SERIES, OPTIONAL ON VB2 and VB3 SERIES</b></p>	<p><b>OPTION FOR THE VBC</b></p>



# Unique System Technologies

					<h2>FUTURE</h2>
<p>The PCAP Filtered Forwarding option provides operators with remote packet capture capability directly into a local WireShark or other PCAP compatible parser. By filtering the packets sent back from the remote system by protocol or header depth full understanding of IP behavior at remote sites, even customer homes can be achieved.</p>	<p>MicroTimelines have been an integral part of all Bridge Technologies systems from the very start. In the VBC they provide massive service understanding of performance the last 96 hours, they provide full insight into ETR290 alarm history on the probes and enables severity understanding for groups of services on the microVB™ systems MDC</p>	<p>The OTT Engine can be installed on all probes and have two different flavors; the single engine with up to 5 channels in parallel for 50 channels or the massive BULK option for up to 50 engines in parallel and 500 channels of HLS, HDS, SmoothStreaming and MPEG-DASH validation on the 10G VB330 probe.</p>	<p>As part of the AEO - Advanced Ethernet Option for the 10G VB330 probe, the microBurst detection and graphing permit understanding of this critical high-speed packet events explaining severe disruptive conditions leading to packet loss for the first time in a media probe.</p>	<p>The PCAP file format provides an universal industry standard for storing IP packet information for later analysis and the introduction of this feature into the 10G VB330 probe enables the ultimate of packet inspection and analysis at any point in the network equipped with probes. Record to memory in the probe and download via the web browser to your local computer for further analysis.</p>	
<p><b>OPTIONAL FOR MDC AND microVB™</b></p>	<p><b>STANDARD ON ALL SYSTEMS</b></p>	<p><b>OPTIONAL ON ALL PROBES, BULK ON THE 10G VB330</b></p>	<p><b>OPTIONAL WITH AEO FOR THE 10G VB330</b></p>	<p><b>OPTIONAL WITH AEO FOR THE 10G VB330</b></p>	

