



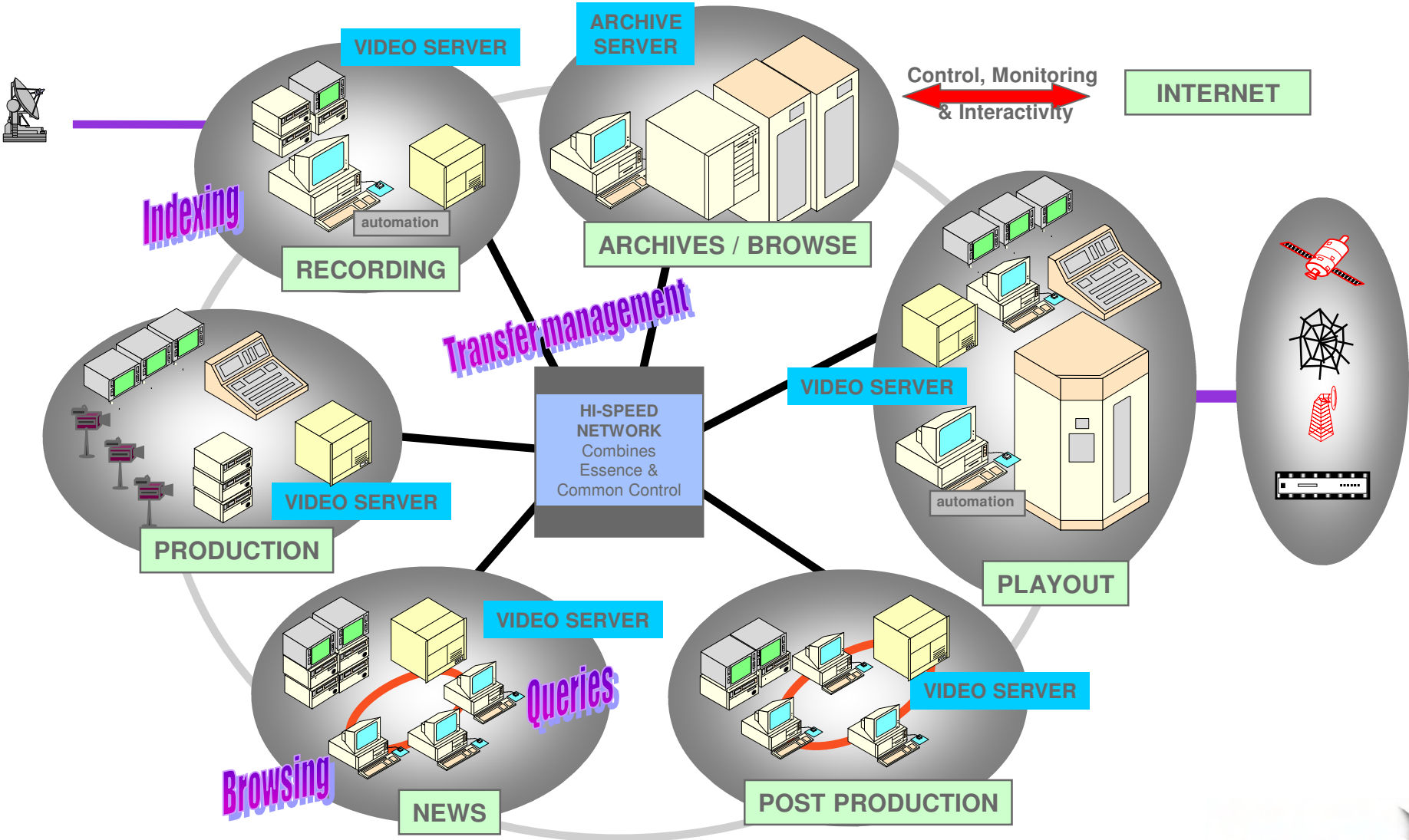
THOMSON
images & beyond

IP Networked Studio Infrastructure for Synchronized & Real-Time Multimedia Transmissions

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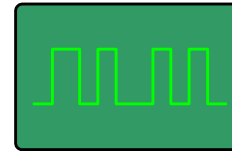
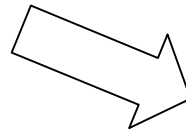
Functional Overview Diagram



Studio evolution



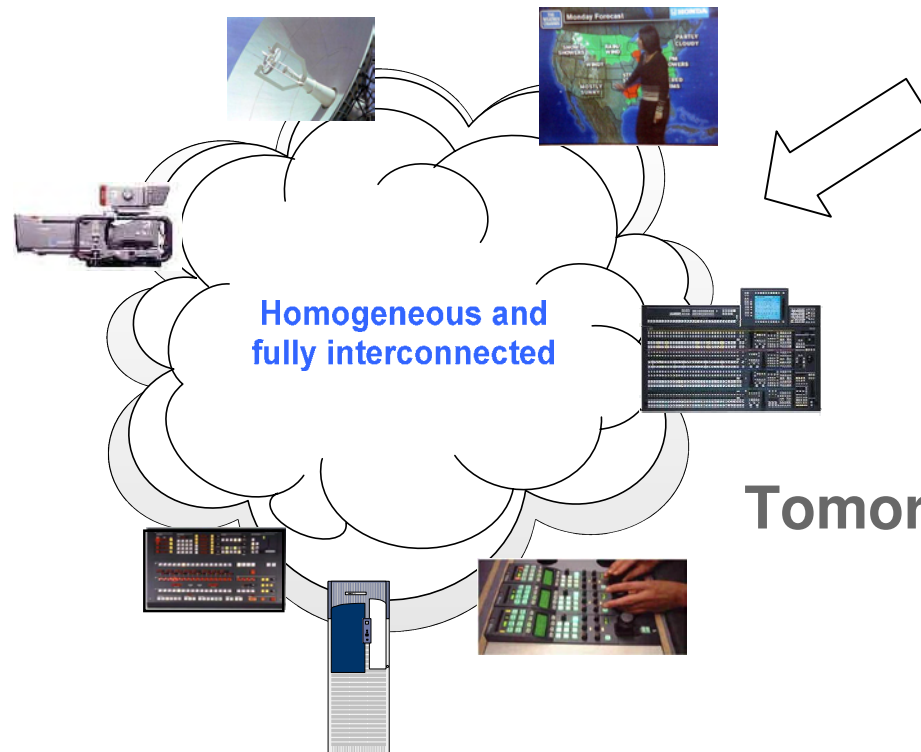
Yesterday



DIGITAL



Today



Tomorrow

Studio infrastructure nowadays

- **Several and heterogeneous communication infrastructures**
 - According to their domain of constraints
 - real-time for production, non real-time for post-production
 - According to the essences they convey
 - Video, audio, synchronization, devices control/command, intercom (voice)
 - According to their technology
 - Analogical, digital, point to point, point to multipoint, synchronous, asynchronous
 - According to their communication mean
 - Signal processing, IP protocol, direct register access



Overall Production Dataflow requirements

- **Bandwidth**

- High sustained bit rate (from 270Mb/s to 1,5Gb/s for SD & HD SDI compatibility on a single stream)
- No dropped data

- **Time Predictability**

- Low to medium latency (less than one frame)
- Minimal and deterministic jitter (scale of tens of nanosecond)

- **Resource reservation**

- Virtual dedicated channel
- Real time guaranteed data delivery
- Ordered data
- Non duplicated and lost data (no retries)

- **Scalability**

- **Homogeneity**

- **Responsiveness**

Challenges

- **Genlock**

- Synchronization in frequency and phase of all connected devices from the cameras to the video switcher (scale of tens of nanosecond)

- **Virtual Audio/Video matrix**

- Keep the availability:
 - to address each of the connected devices (e.g. camera and monitor, camera and switcher input, etc.),
 - to gather set of sources and destinations
 - to switch from one group to another in respect of synchronous event (e.g. frame basis).

- **QoS management**

- Different priorities of dataflow: Simultaneous high bit rate streaming, system communication and data exchange sharing the same medium.
- Dynamic and exhaustive view of the network's topology including connected devices

- **Wired and Wireless continuity**

- Ensure the service's continuity between wired (Ethernet) and wireless (Ethernet over 802.16) parts.

- **Control and monitoring**

- Provide a complete network supervision in accordance with the TV studio usage
- Support current communication features (intercom, tally, etc.)