Telecommunications and Information Exchange Between Systems

ISO/IEC JTC 1/SC 6

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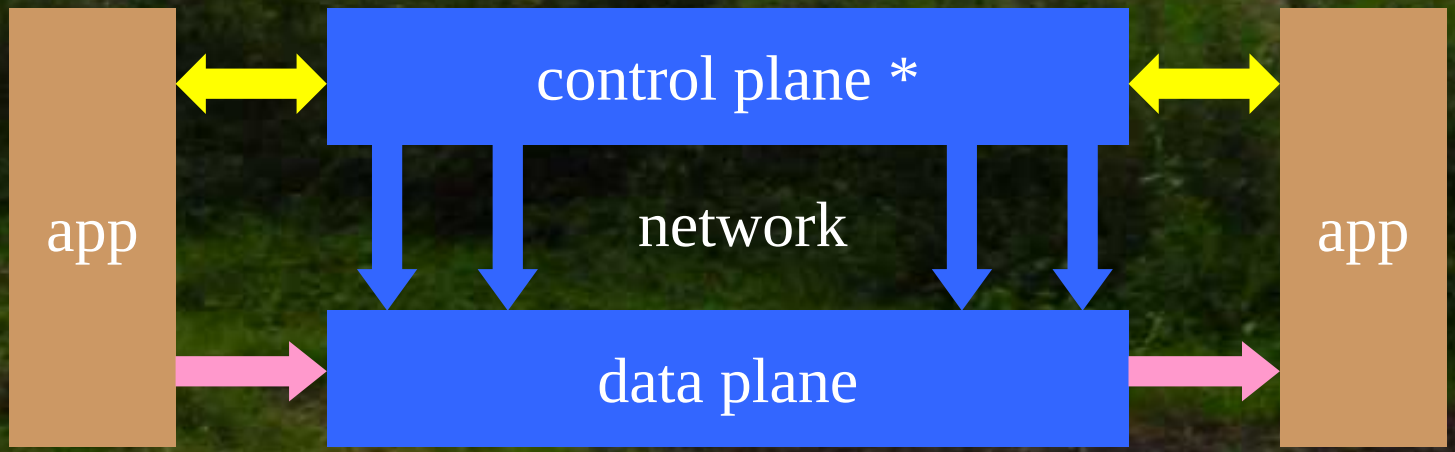
Nine Tiles

Switching in the Future Network

Nine Tiles Networks Ltd
Cambridge, England
www.ninetiles.com

Model



* call control / signalling if connection-oriented
  SIP / DNS / etc if connectionless

Services provided by the control plane

- identifying how to reach the called party
  - reply may be
    - an IP etc address if connectionless, or
    - a handle on the route, e.g. virtual channel identifier
- configuring the data plane
  - to provide agreed QoS
- conveying information between apps
  - to configure encoding / decoding / etc

Service provided by the data plane

- conveying data between apps
  - probably packets
  - might be other kinds of stream

IEC 62379 Common Control Interface

- Part 1 (published)
  - aspects common to all equipment
- Parts 2-4 (2 published, 3 under development)
  - controlling media processing in network-attached equipment
- Part 5 (under development)
  - controlling media flows within the network

IEC 62379-1: general

- protocol based on SNMP (RFC1155-1157)
- OIDs used to uniquely identify
  - MIB objects
  - block types
  - media formats
  - network address formats
- private OIDs still unique (unlike MIME types)
  - e.g. enterprise numbers (1.3.6.1.4.1)

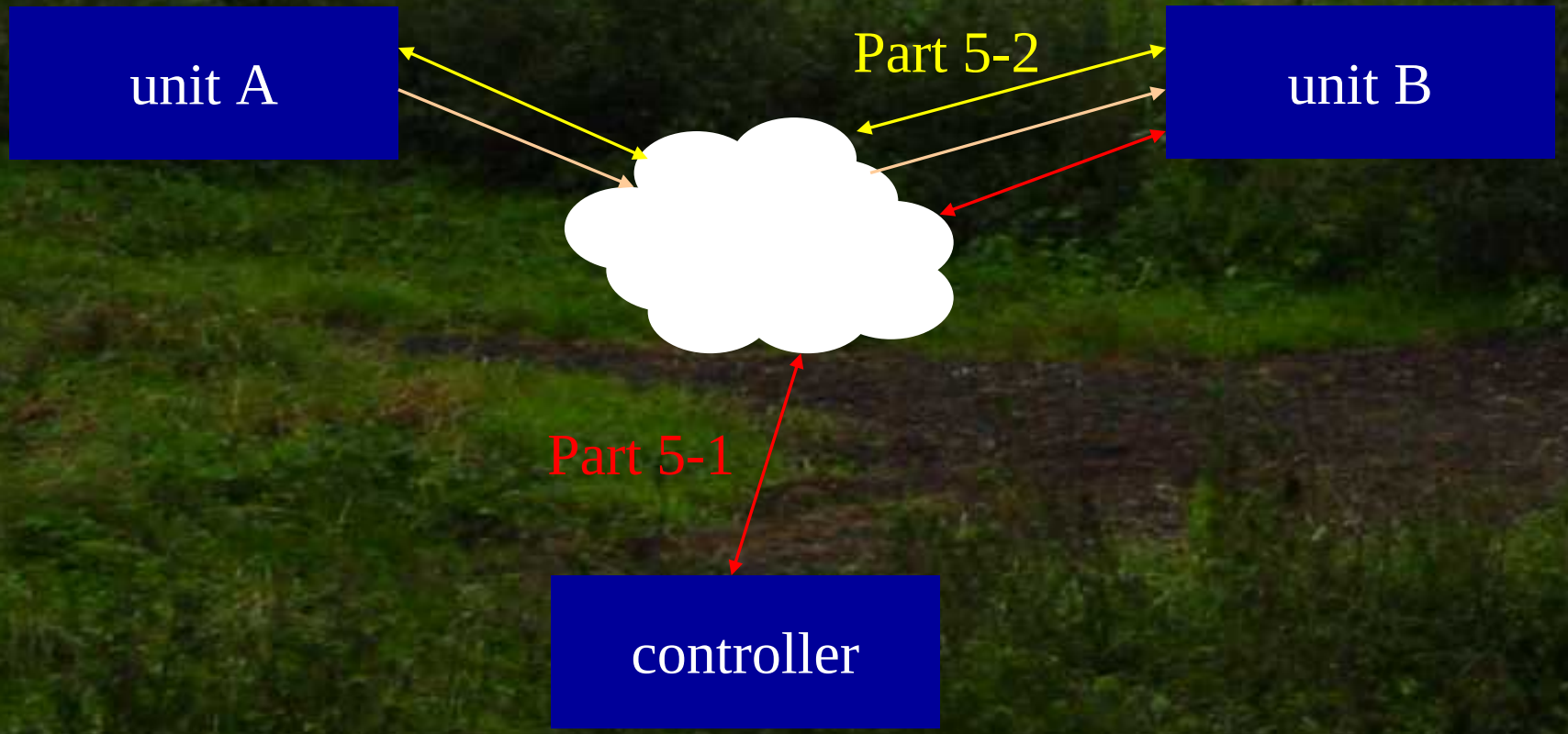
IEC 62379-1: general

- software upload
- unit identity and status
- reference clock
- real-time clock
- scheduled operations

IEC 62379-5: networks

- Two kinds of data plane service
  - foreground, for media flows
    - point-to-multipoint
    - constant bit rate
    - guaranteed latency
  - background, for other data
    - point-to-point
    - potentially bursty traffic
    - best-effort service

IEC 62379-5: networks



IEC 62379-5: networks

- IEC 62379-5-1: general
  - network port blocks
    - state, address, link partner's address
  - lists of media calls
    - called and calling addresses, call identity, media format, QoS parameters, etc
  - procedure for requesting media call connection
    - management terminal requests destination unit to "take" media flow from source

IEC 62379-5: networks

- IEC 62379-5-2: signalling
  - setting up calls across heterogeneous networks
    - messages passed between networking equipment
      - interfaces, switches, etc
    - TagLengthValue format for Information Elements (IEs)
      - not text (unfriendly for microcontrollers)
      - not SNMP (though some values are OIDs)
    - supports multiple address formats

IEC 62379-5-2: signalling

- Links (point-to-point, subnetwork, or cloud)

- Connection on each link uses native protocol

IEC 62379-5-2: signalling

- IEs in messages include
  - called and calling addresses
  - call identity
  - media format
  - QoS parameters
    - lets destination know how much buffering needed
  - charging information
    - makes media easy to pay for, like ring tones

IEC 62379-5-2: signalling

- Address formats
  - global
    - locator + local address
    - TDomain + TAddress
    - IP address
    - URL
    - E.164 address
  - local to subnetwork
    - EUI-64
    - MIB object OID + value (e.g. unitLocation)
  - local to equipment
    - IEC 62379 block number
    - TCP/UDP port number

IEC 62379-5-2: signalling

- QoS parameters
  - packet size and rate
    - specified by the application
    - may be several choices, linked with other IEs
  - maximum and minimum delay
    - specified by the network
    - may offer different routes with different delays
    - choice may be linked to other IEs, e.g. cost

IEC 62379-5-2: signalling

- Application supplies information for request
  - including “flow identifier”
- Interface driver makes connection on network
  - builds and sends message if network supports it
  - else uses the information for SIP etc request
- Driver tells application result of connection attempt
  - including QoS achievable
- Application identifies packets by flow identifier
  - driver may use VCI, IPv4 address + port number, etc

IEC 62379-5: networks

- More information at:

  www.iec62379.org

  - or Google “Common Control Interface”

- Drafts at

  - http://www.iec62379.org/docs/Common%20Control%20Interface%20Part%205-1%20draft%20091014.pdf and
  - http://www.iec62379.org/docs/Common%20Control%20Interface%20Part%205-2%20draft%20091014.pdf

Flexilink

- Two layers of data
  - foreground: circuit switched, guaranteed low latency
    - point-to-multipoint
    - packets identified by position in frame
    - no routing information in the packet header, only length
  - background: circuit or packet switched, best effort
    - point-to-point
    - circuit-switched have channel number, like ATM VCI
    - packet switched are IP datagrams

Flexilink

- More information at:

www.ninetiles.com