Path-coupled signaling for traffic measurement

Fredi Raspall, Miquel Martin,
Juergen Quittek, Marcus Brunner

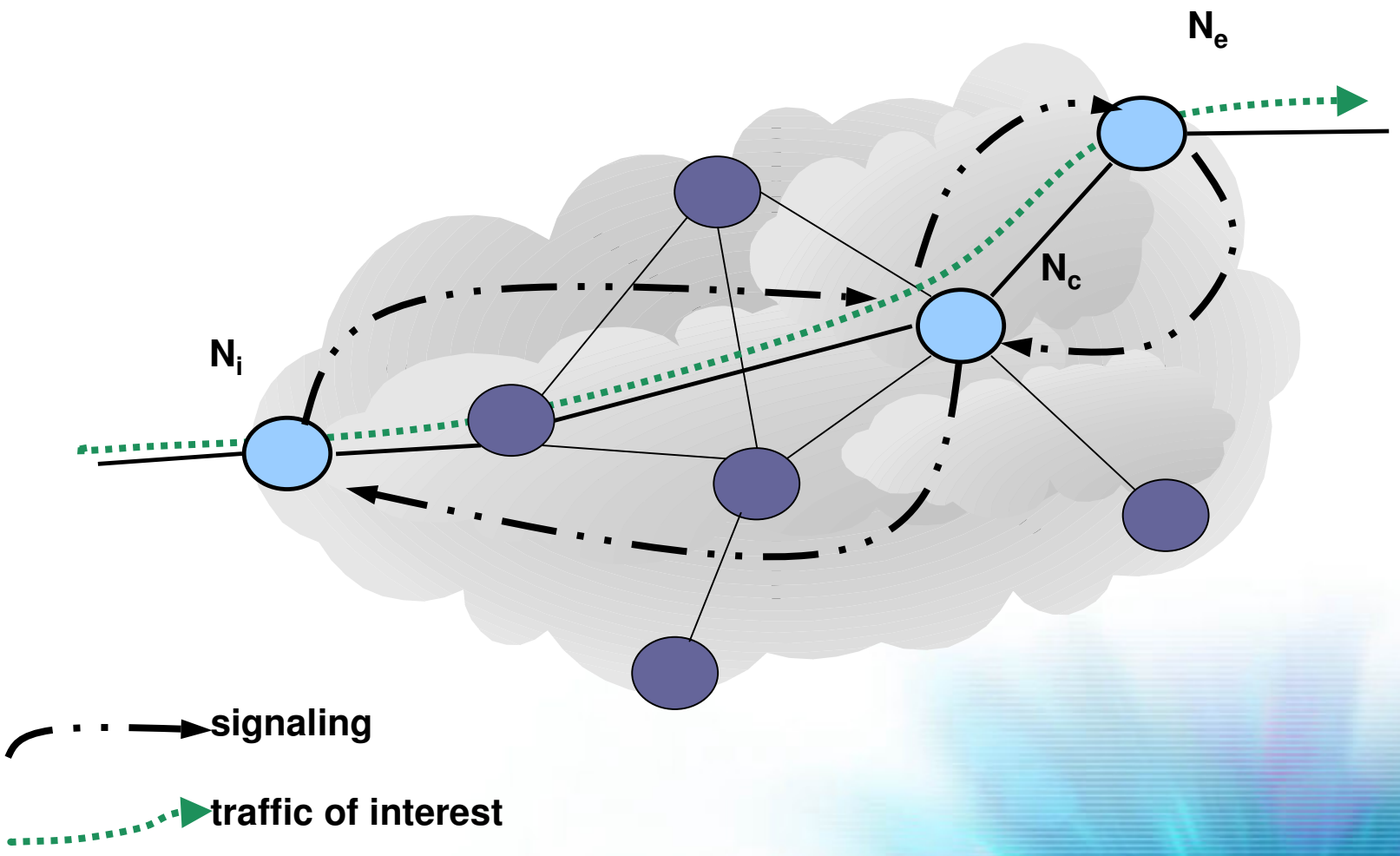
Background: Active versus passive measurements for flows

- **Active measurements**
  - E2e measurements on a path
  - No need for network support (core network)
  - Inject traffic (measures not real traffic), e.g., traceroute, ping, …)
- **Passive measurements**
  - Accurate measurement of traffic
  - Measure where you are interested
  - But, needs topology information for flow measurements
  - Needs high speed packet capturing, classification, and metering
  - Complicated configuration of the right measurement points in the network

Signaling for configuration of flow measurements

- Combine the benefits of both methods
- Use a RSVP-like protocol for configuring probes in the network
- Automatically determines the nodes on the path
- Still measure real traffic of interest.

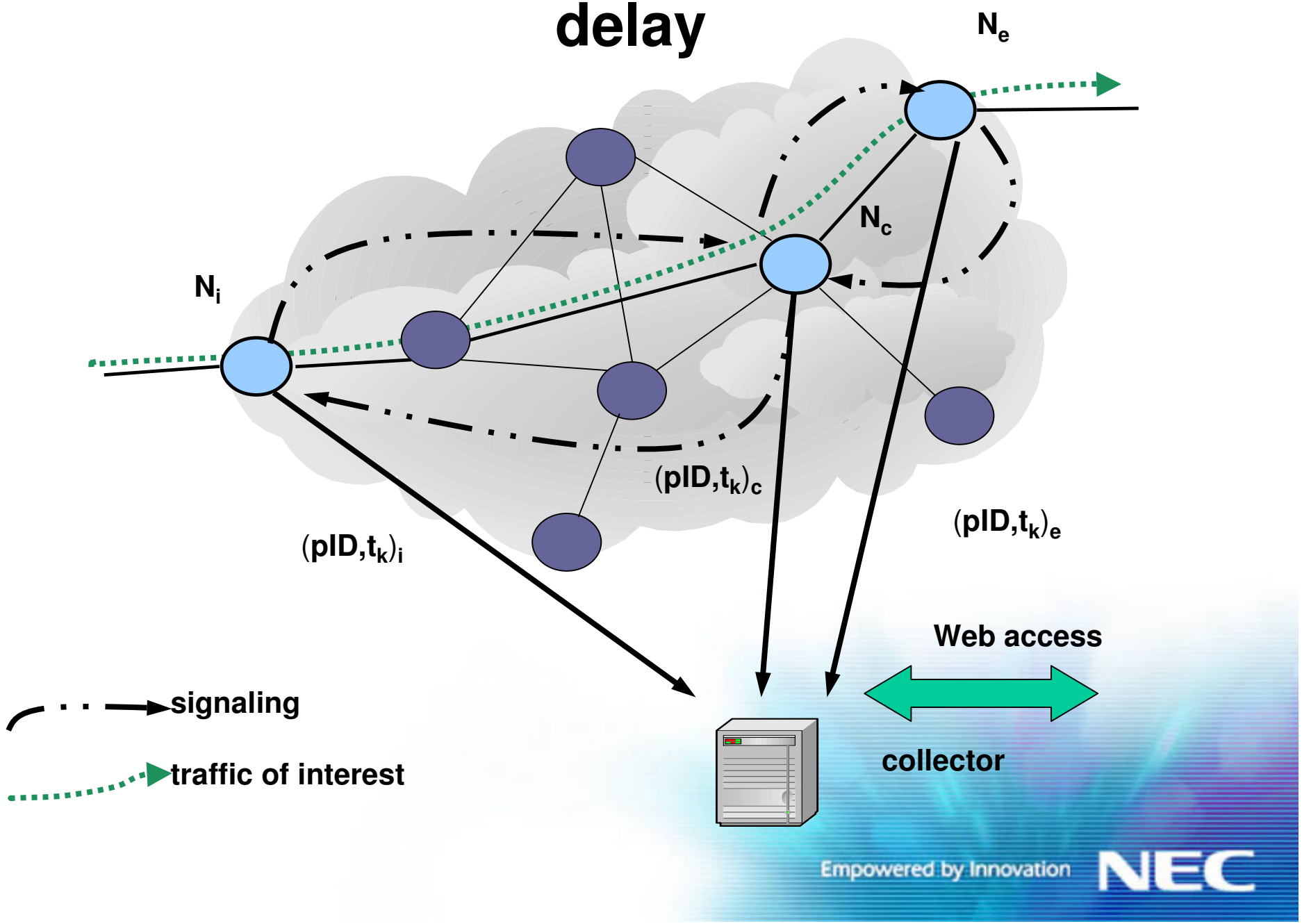
Basic Architecture



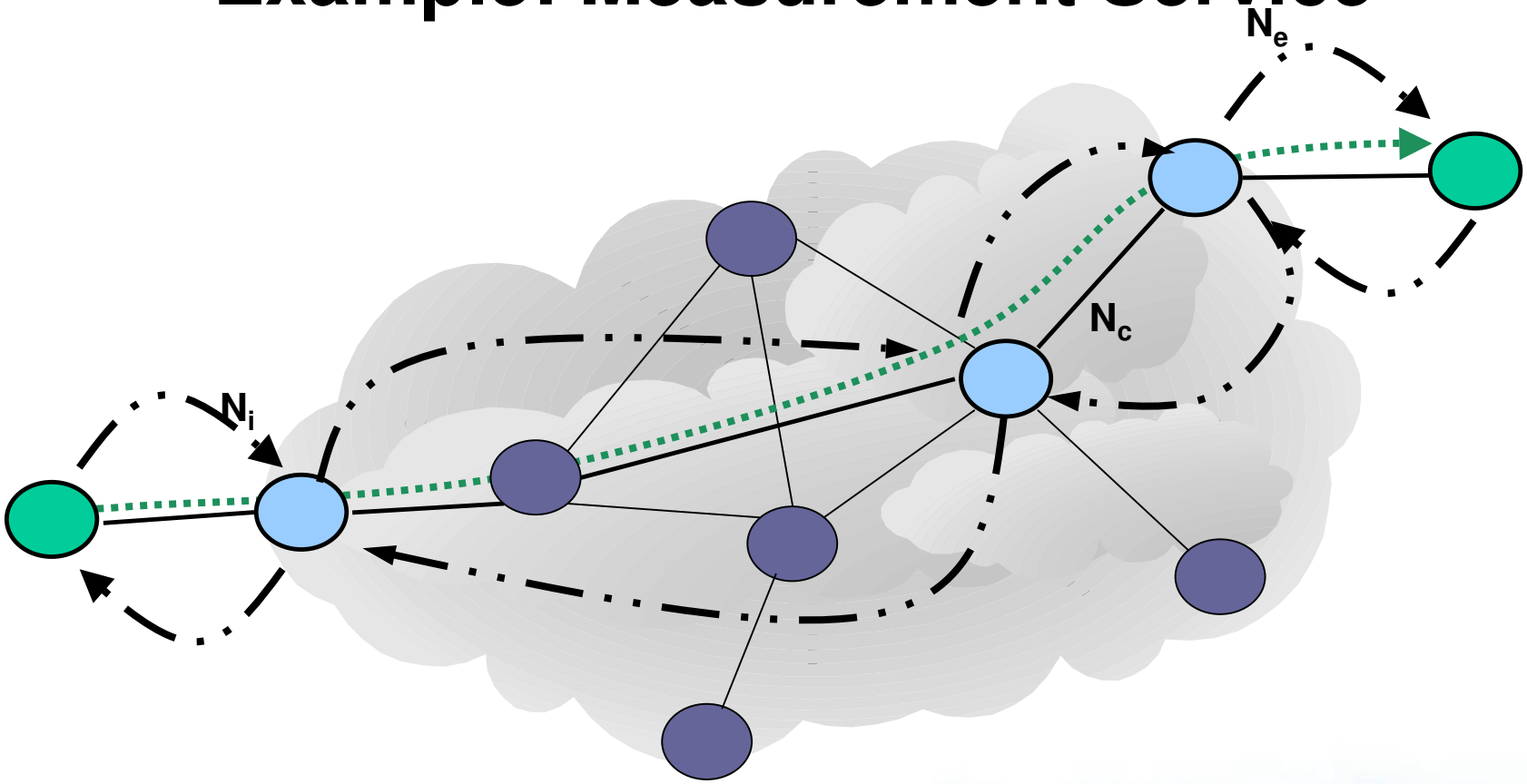
Basic Characteristic

- **Path is defined by IP routing (using path-coupled signaling)**
  - The signaling protocol deals with route changes
  - Follows the same path as the data flow to be measured
- **Signaling protocol carries measurement parameters**
  - to configure nodes which are capable of performing measurements
  - What flow to measure
  - what to measure
  - where to report to
- **The signaling protocol can also be used for gathering reports**

Example: Intra-domain per-segment delay



Example: Measurement Service



Signaling (probe config & result gathering)

traffic of interest

Measurement results sent to signaling initiator using the same signaling protocol

Implementation

- **Use a pre-standard IETF NSIS (Next Steps in Signaling) protocol (implemented)**
- **Implementation of the one-way delay measurement configuration using the signaling protocol and a central collector (one-way delay measurement implemented with central configuration)**

Conclusion

- **Combine the benefits of active and passive measurement technologies**
- **Elegant way of configuring measurement probes for traffic flow measurement**
- **Generic regarding the location of result collection.**
- **Various measurements possible**
- **Only works for flow measurement**
  - but open to the flow definition as long as the flow is still routable