Enhancing Seamless Data Transfer within Complex Mesh Environments with Secure Agents

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Introduction – Networks

A **network** is a set of hardware devices connected together, either physically or logically, to allow them to **exchange** information.

Networks allow computers and **people** to be connected together, so they can **share** resources.

Introduction – Routing

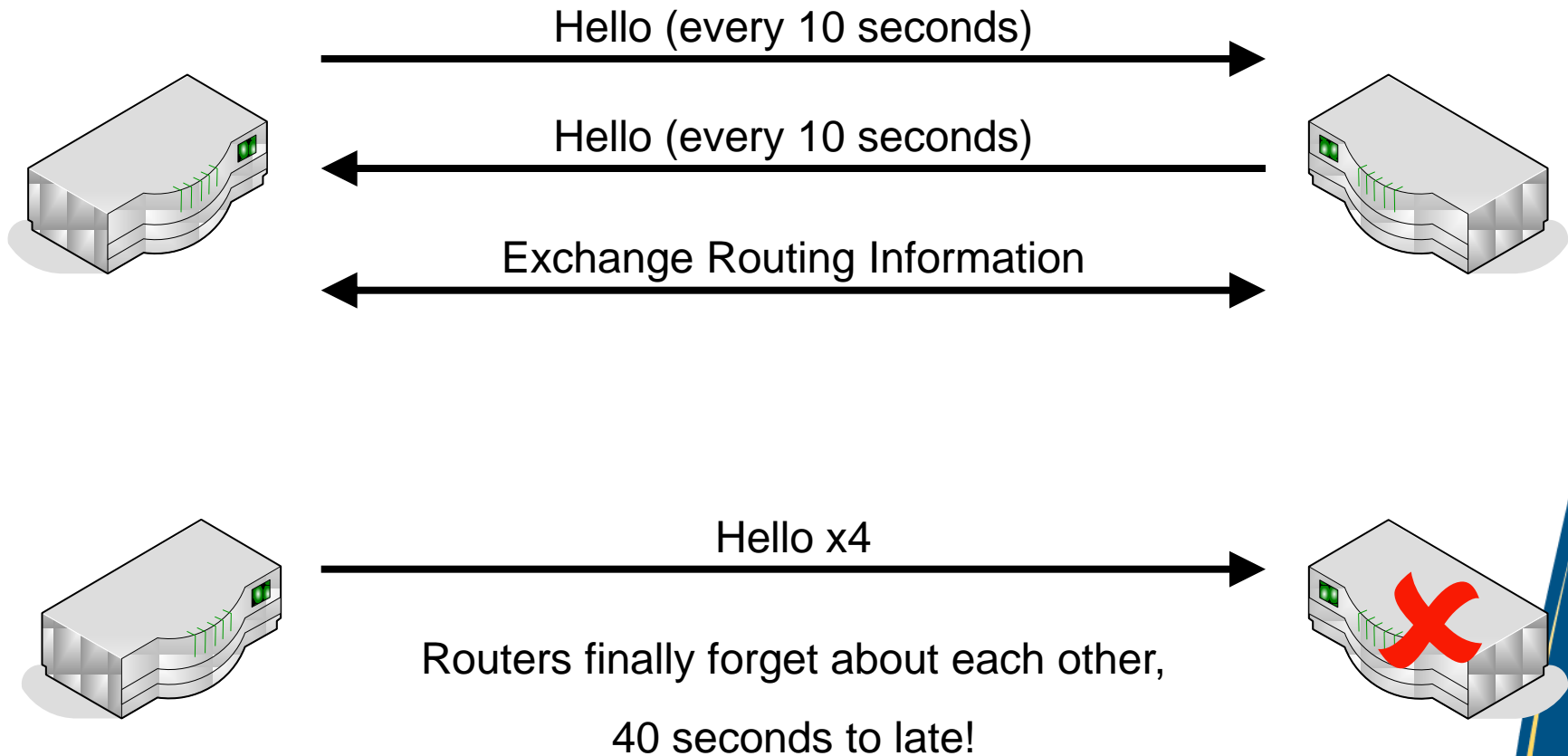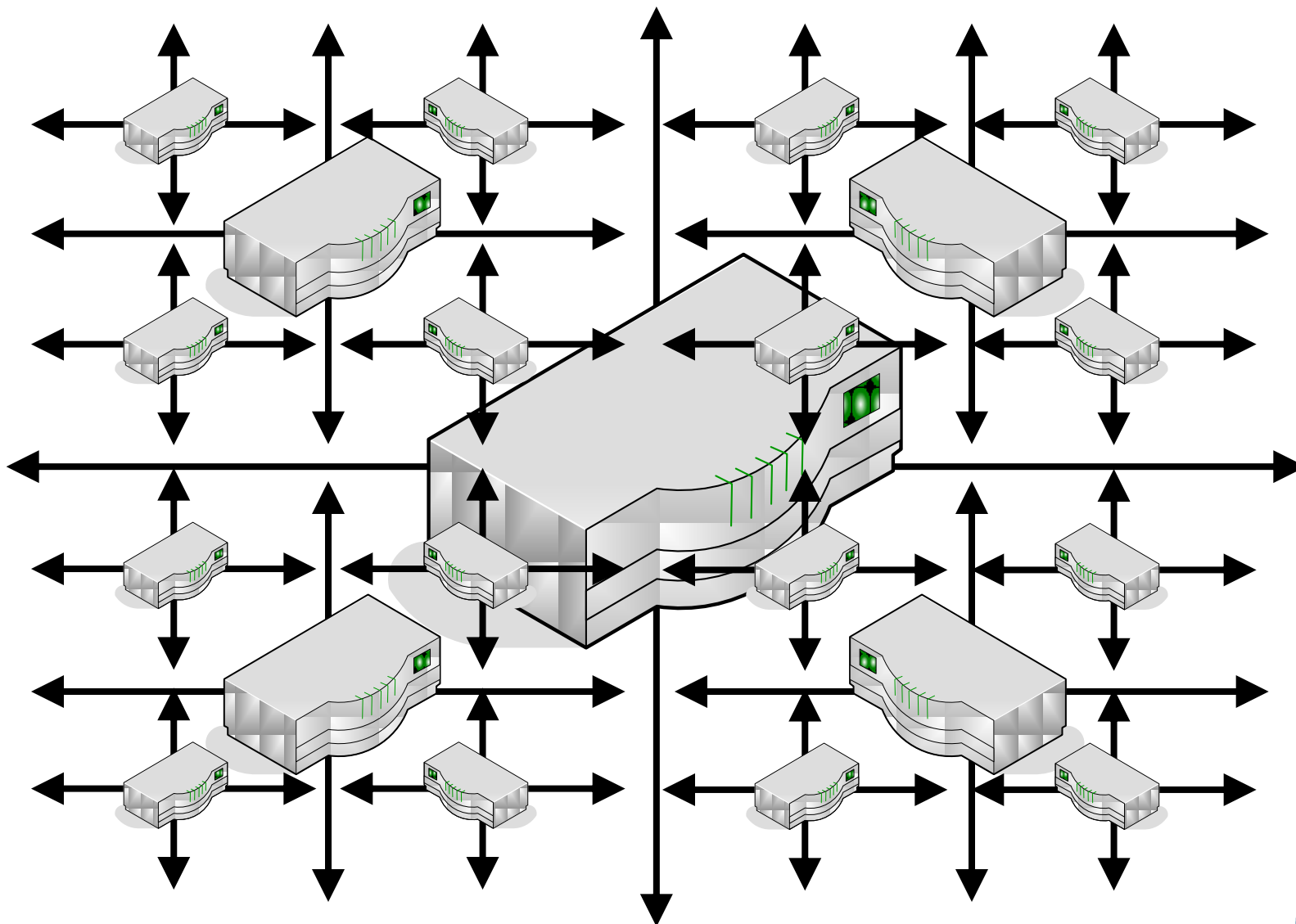|		
A	Via Federico Cesi, 37, 00193 roma	
	288 km (about 2 hours 50 mins)	
1.	Head **north** on **Via Federico Cesi** toward **Via Ennio Quirino Visconti**	0.1 km
2.	Slight **left** at **Piazza della Libertà**	50 m
3.	Turn **right** toward **Piazza della Libertà**	29 m
4.	Turn **right** at **Piazza della Libertà**	0.2 km
5.	Continue on **Via Ferdinando di Savoia**	0.1 km
6.	Turn **right** at **Via Maria Adelaide**	75 m
7.	Turn **right** at **Via della Penna**	0.2 km
8.	Continue on **Lungotevere**	0.5 km
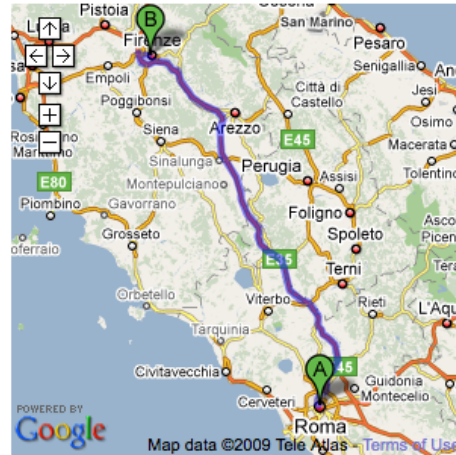
Q. How to get from point A to B?

A. Provide directions!

Most Networks use dynamic Routing Protocols to 'learn' the location of B.

Sources: tripit.com; googlemapsmania.blogspot.co.uk

Introduction – Routing Protocols

Hello (every 10 seconds) →

← Hello (every 10 seconds)

← Exchange Routing Information →

Hello x4 →

Routers finally forget about each other,

40 seconds to late!

Introduction – Multi-Bearer

Problem Details (1)

- Timeout of routing information
  - default 40seconds (for OSPF)
- Trade-off exists between bandwidth usage and up-to-date routing information
  - Send 'Hello' messages every second
- Bigger the network, the more bearers:
  - bigger the issue
- Designated and Backup routers
- Remote changes beyond local router

Problem Details (2)
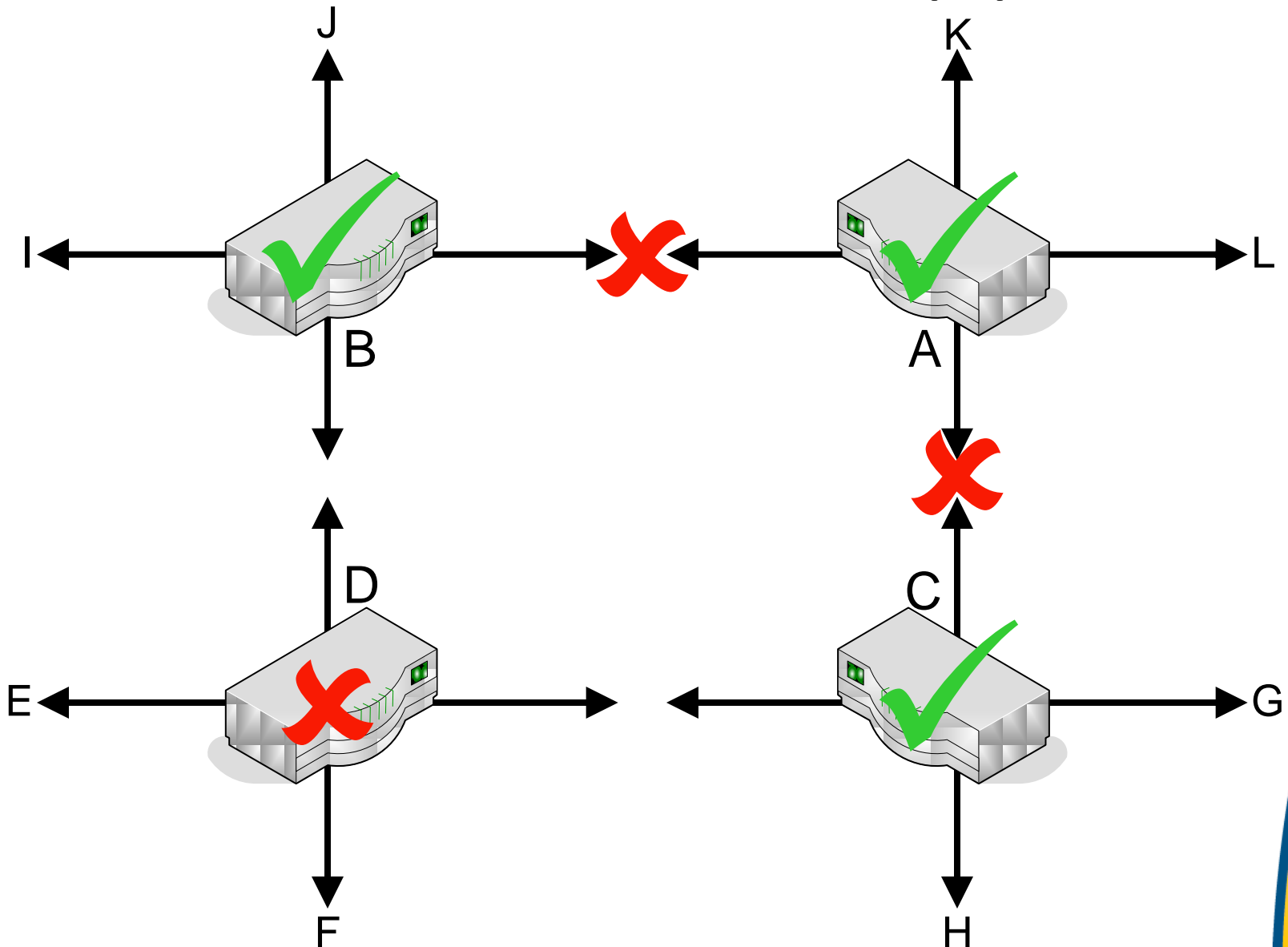
Solution (1)

- MBR already utilises Route Rules to understand destinations within the network

- A Route Rule describes the ultimate destination and which interfaces which is accessible via at any one point in time.

- A Network State Collector was developed
  - Each MBR registers with the NSC
  - Each MBR passes its Local Knowledge to the NSC
  - Each MBR updates the remote copy of Local Knowledge when interfaces change

Solution (2)

- The NSC puts all MBRs Local Knowledge together to create Global Knowledge

- Global Knowledge is tailored for each MBR and then passed back to that MBR so it can update its set of Route Rules

- Utilised Secure Agent Infrastructure for security and integrity of Knowledge messages

- SAI opened the door to allow several types of messages to be consumed by the MBR
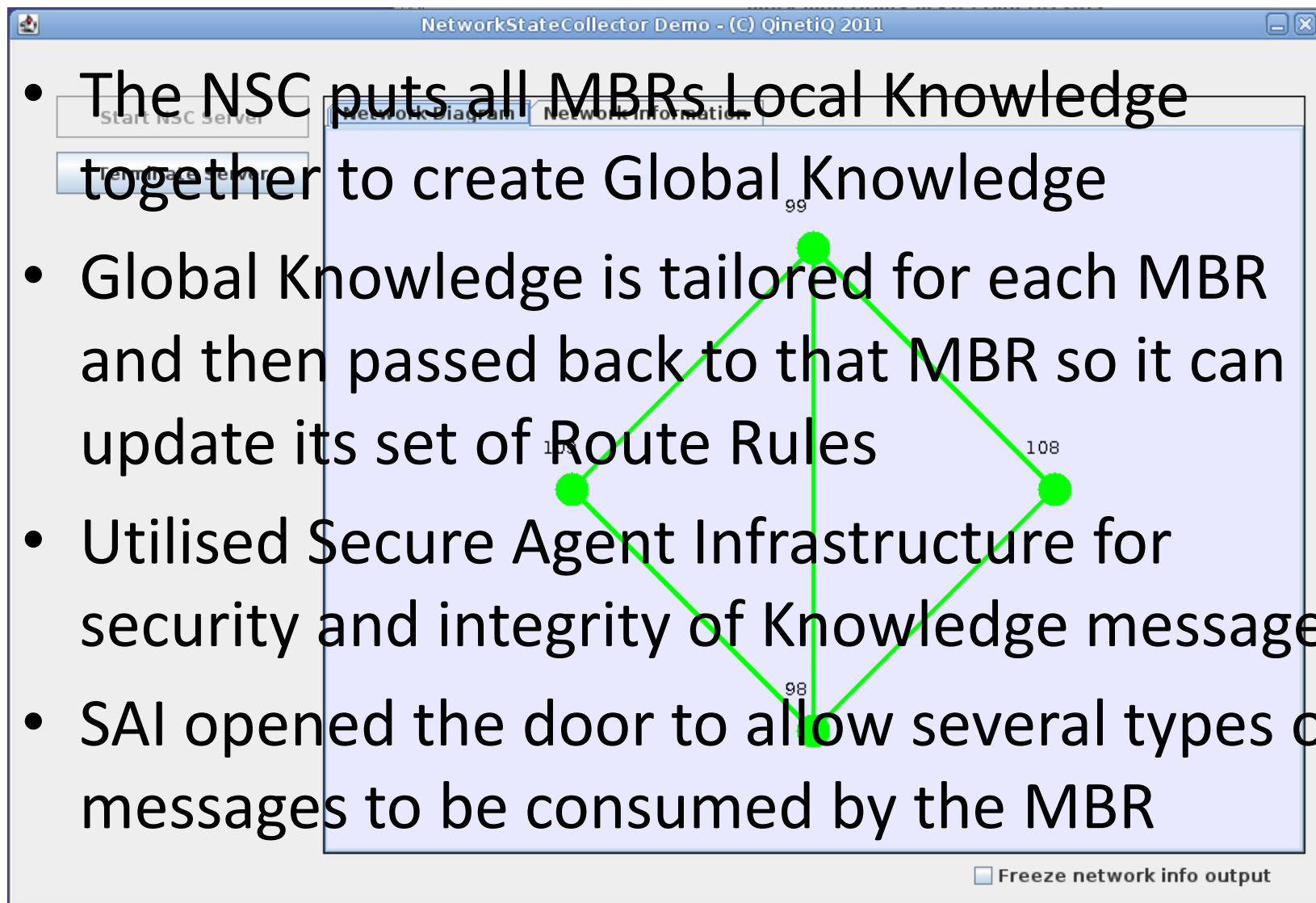
Steps Ahead

- De-centralise the NSC
- Combine Route Rule and Routing Protocol technologies
  - Reduce network bandwidth footprint
  - Save duplicating information
- Utilise our own patented Routing Protocol (Routing Bridge) to assist in translation between routes and Route Rules

SECRICOM
Seamless Communication for Crisis Management

Recover
quickly

Keep on

talking

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