

mPlane – an Intelligent Measurement Plane for Future Network and Application Management

The ubiquity of Internet access, and the wide variety of Internet-enabled devices and applications, have made the Internet a principal pillar of the Information Society. Decentralized and diverse, the Internet is resilient and universal. However, its distributed nature leads to operational brittleness and difficulty in identifying and tracking root causes of performance and availability issues. The first step to improve this situation is measurement: illuminating the currently obscure dynamics of the Internet. To address this, the project advocates a measurement plane, or mPlane, alongside the Internet's data and control planes.

The mPlane will consist of three main components:

- the Measurement Layer, which combines a set of new (software and hardware) programmable mPlane probes with legacy probes adapted to the mPlane measurement layer

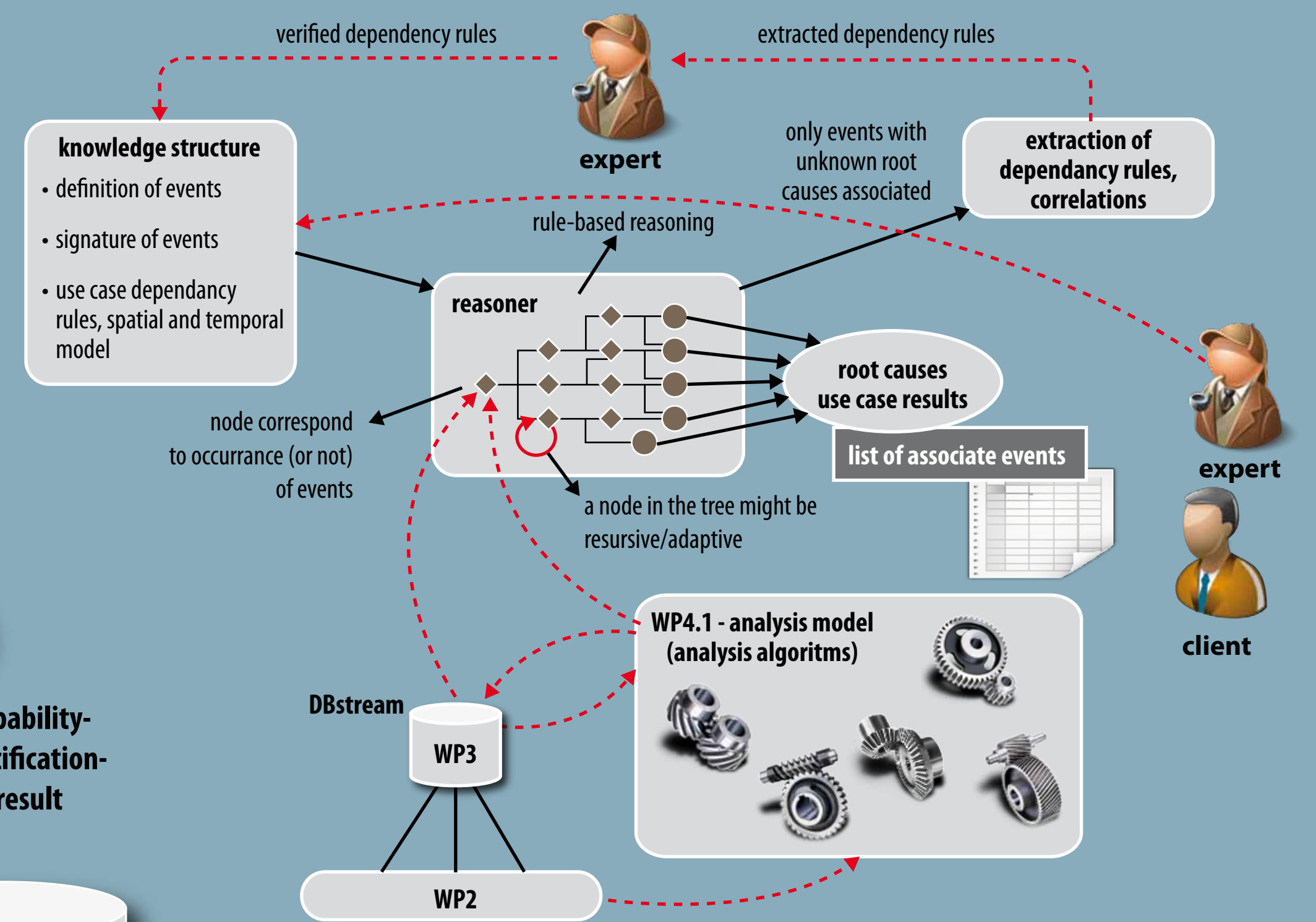
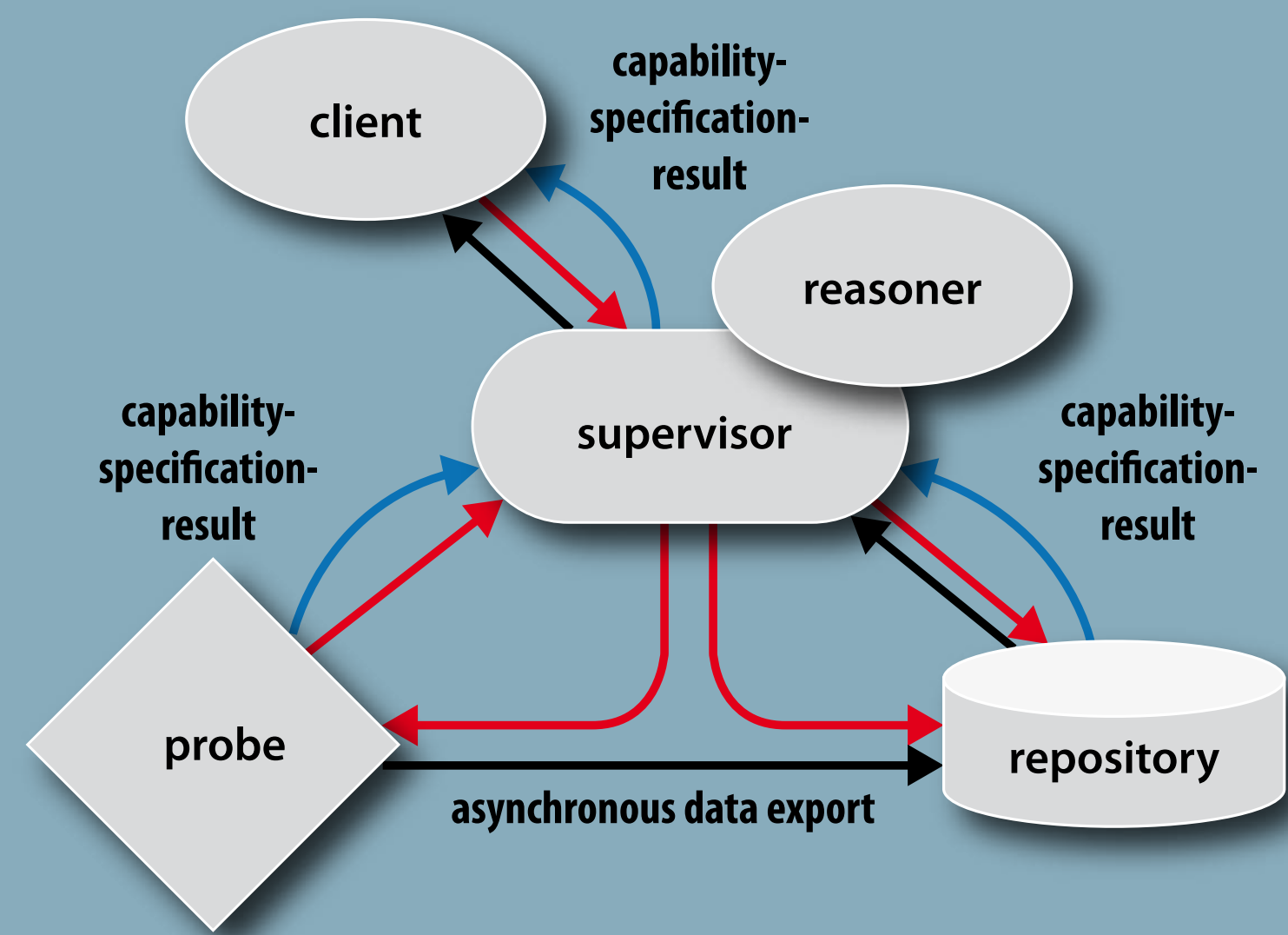
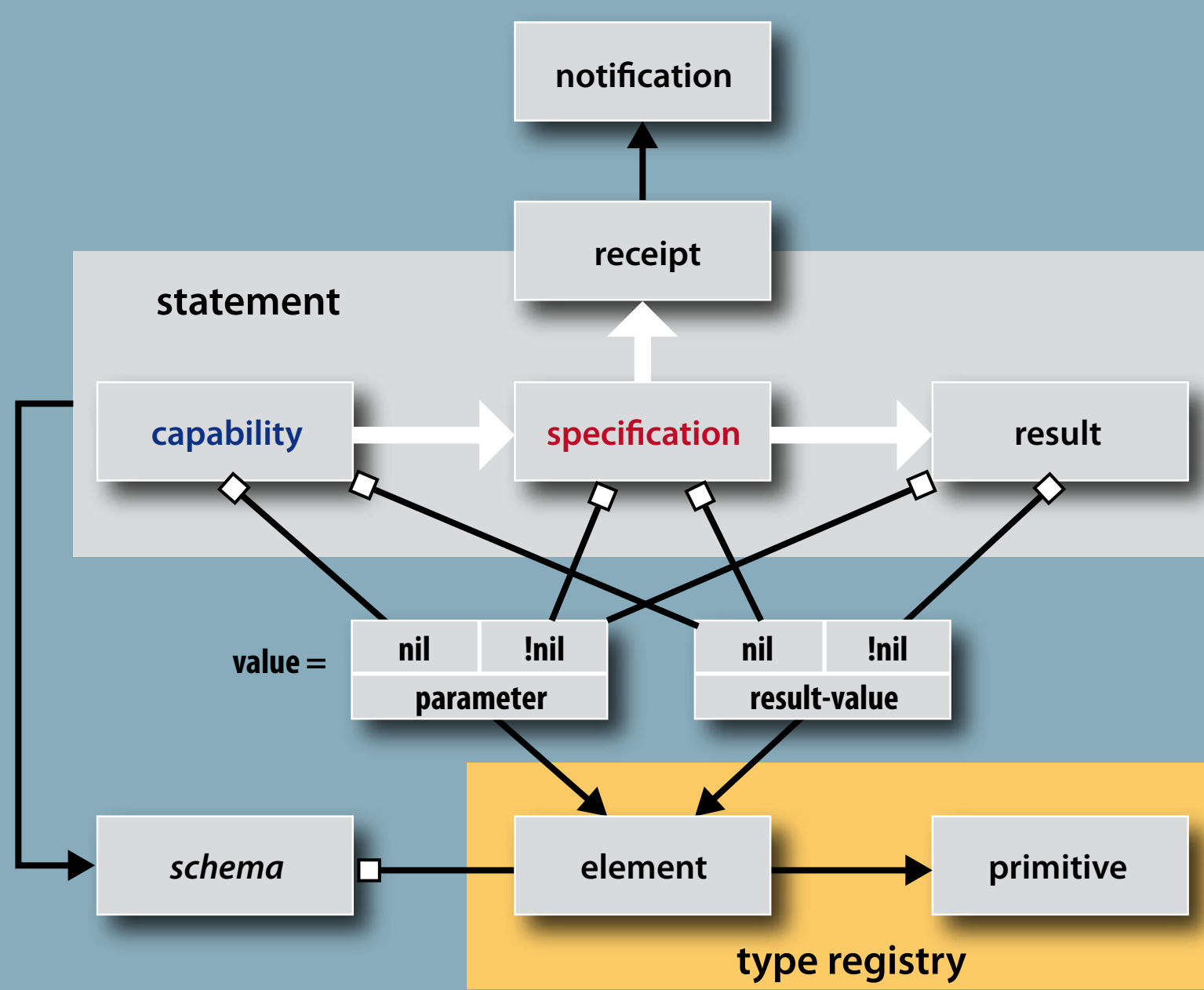
interface into a common, large-scale, distributed measurement layer, which is concurrently accessible to a wide set of stakeholders (ISPs, Application Providers, Regulators, Researchers, etc.);

- the Repository and Analysis Layer, which provides an efficient framework to store and process the large volumes of data collected by the measurement layer. Data will be collected from each probe in a standard and way, and pre-processing of the large amount of data will be possible in an efficient way;
- the mPlane Supervisor, which controls the actions and synthesizes the results of the far-flung probes and repositories, and iterates on these results to drill down to the root cause of a specific issue and/or investigate the relationship underlying a general phenomenon. This iterative analysis, sup-

ported and automated by an intelligent reasoner, is sorely missing in present measurement systems, and is one key element of the measurement plane.

By enabling pervasive measurement throughout the Internet, mPlane benefits everyone:

- Internet Service Providers get a fine-grained picture of the network status, empowering effective management and operation
- Application providers gain powerful tools for handling performance issues of their application
- Regulators and end-users can verify adherence to SLAs, even when these involve many parties
- Customers of all kinds can objectively compare network performance, improving competition in the market.



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Alcatel-Lucent provides solutions that enable service providers, enterprise and governments worldwide, to deliver voice, data and video communication services to end-users.

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Carries out consultancy activities for the Italian Government and Parliament, the Authorities, Public Institutions and regional and local Administrations.

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Fastweb FW Italy (ISP)

FASTWEB, with 1.77 million customers, is one of the main telecommunications providers in Italy. The company has invested in a new-generation fiber network spanning more than 33,000 kilometers.

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The Eidgenössische Technische Hochschule (Swiss Federal Institute of Technology) Zurich (ETH) is a world-class research university, founded by the Swiss government in 1854. The Communication Systems Group (CSG) at the Computer Engineering and Networks Laboratory (TIK) conducts cutting-edge research in wireless and mobile networking, network measurement, and network security.

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Alcatel-Lucent product portfolio in IP, wireline/wireless and Optics technologies enables Internet service providers, enterprises and governments worldwide, to deliver voice, video, multimedia, and data communication services.

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Founded in 1710 as an Academy of the Arts, the University of Applied Sciences Augsburg (www.hs-augsburg.de) today is the home to seven faculties and three competence centres ranging from Computer Science and Architecture to Design and Business.

FTW FORSCHUNGSZENTRUM TELEKOMMUNIKATION WIEN GMBH FTW Austria (Research)

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