

The Status Report

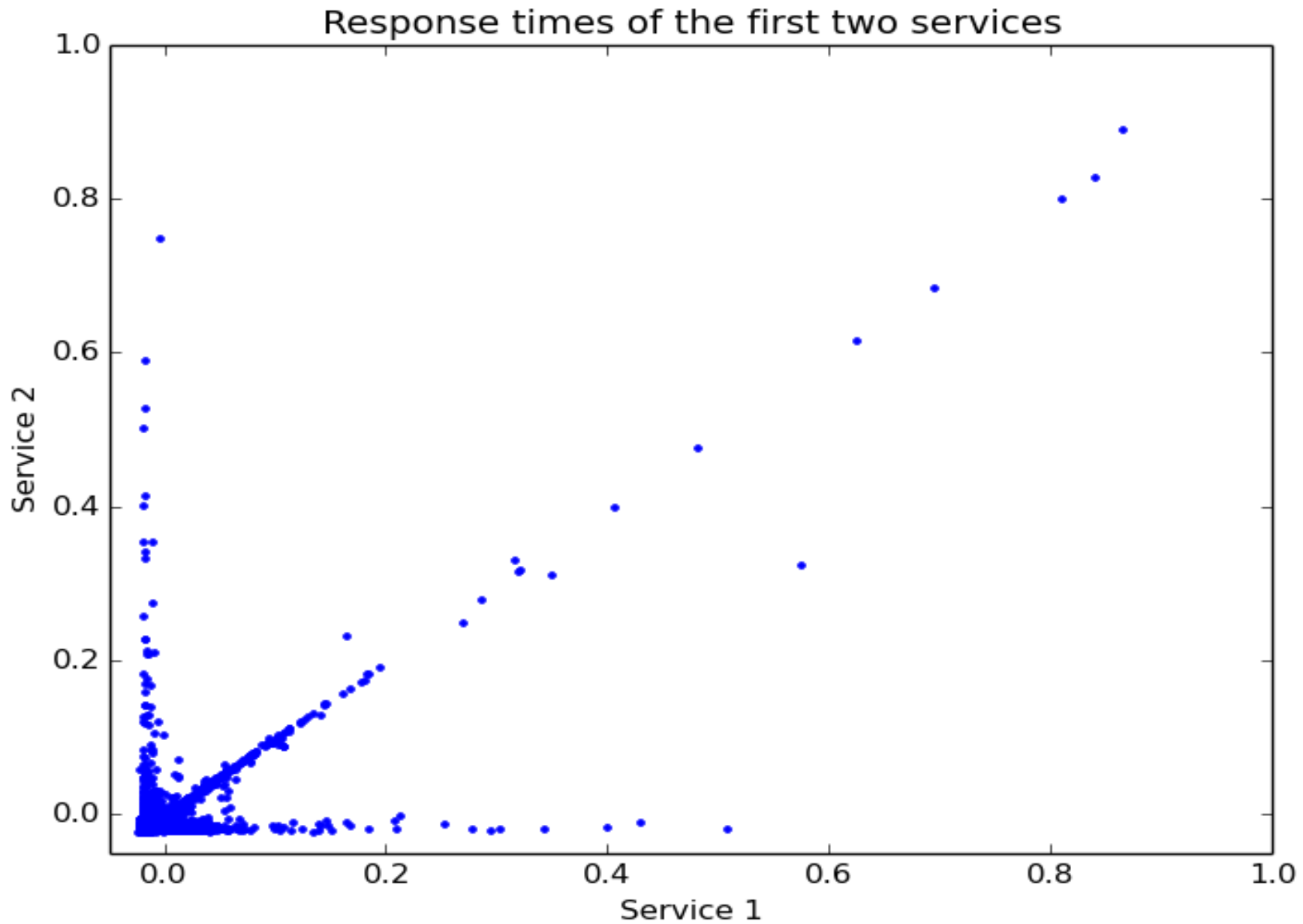
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- **Composite Service**
- **Clustering**
- **Methods**
- **Plots**

- Communication between applications is achieved with services.
- Composite services consist of sub-services and allow more complex operations.
- Status of a composite service is not easily identified.

- A Composite Service relies on the Status of all of its sub-services.
- The Status of a single basic sub-service is determined by its response time.
- The response-times of the sub-services at a given time can be interpreted as a point in the phase-space.
- Multiple measurements show patterns in the phase-space.





- It is possible to attribute each point in the phase-space to a cluster corresponding to a status of the composite service.
- Necessary steps:
 - Determining the optimal number of clusters
 - Determining the actual clusters

- K-Means-clustering
 - Starts with randomly distributed cluster centres.
 - Attributes data-points to the cluster centre they are closest to.
 - Calculates new cluster centres as the mean of the points in the cluster.
- Hierarchical Clustering (Agglomerative)
 - At the beginning each data point is a separate cluster.
 - Clusters are merged based on distance.
 - Provides different levels of clustering.

- Using the K-Means-Algorithm for different numbers of clusters
 - The sum of squared distance (SSE) from cluster centre drops significantly at right cluster number (Elbow Method).
- Hierarchical Clustering
- Principle Component Analysis
 - Number of principle components that cover most of the variance of the data (>95%) is a good estimate for the number of clusters.

