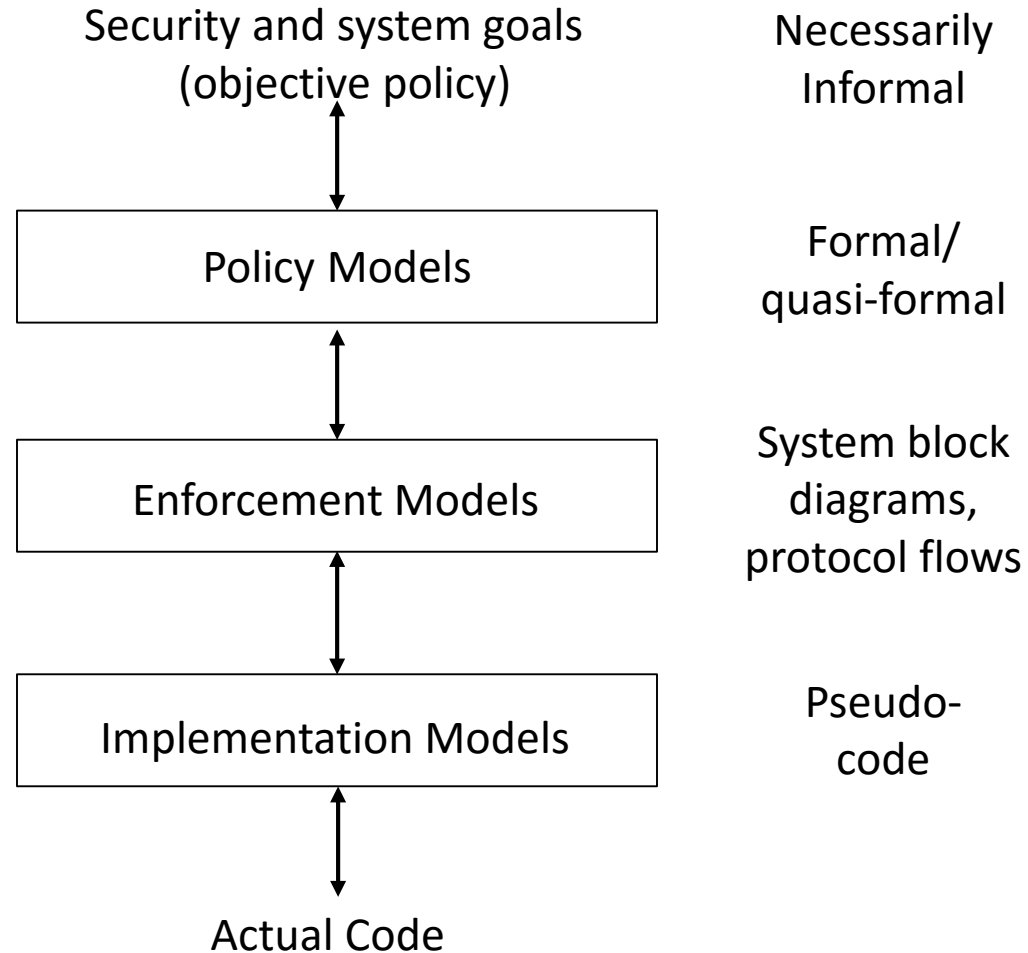


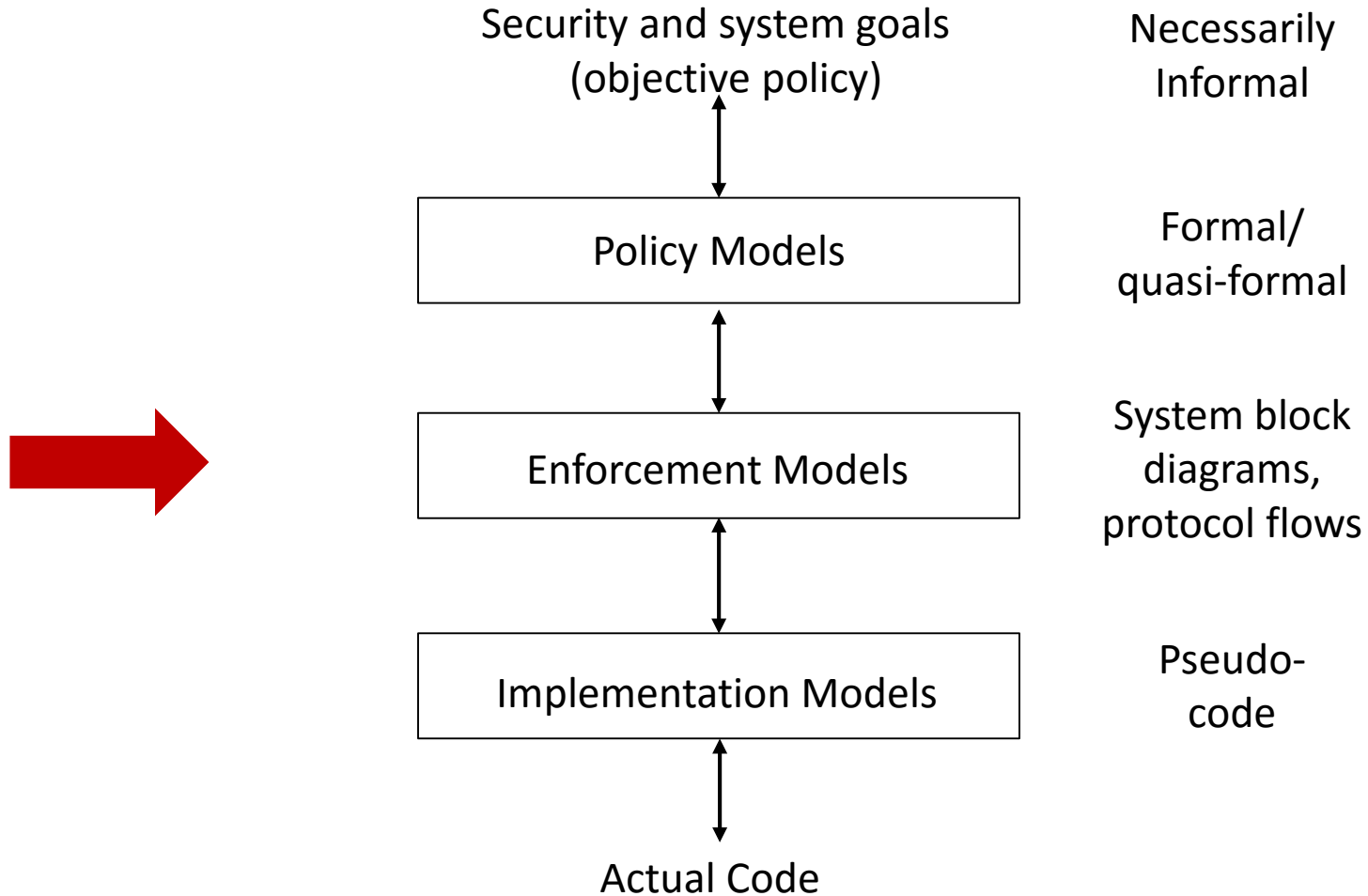
Towards ABAC in Hadoop Ecosystem

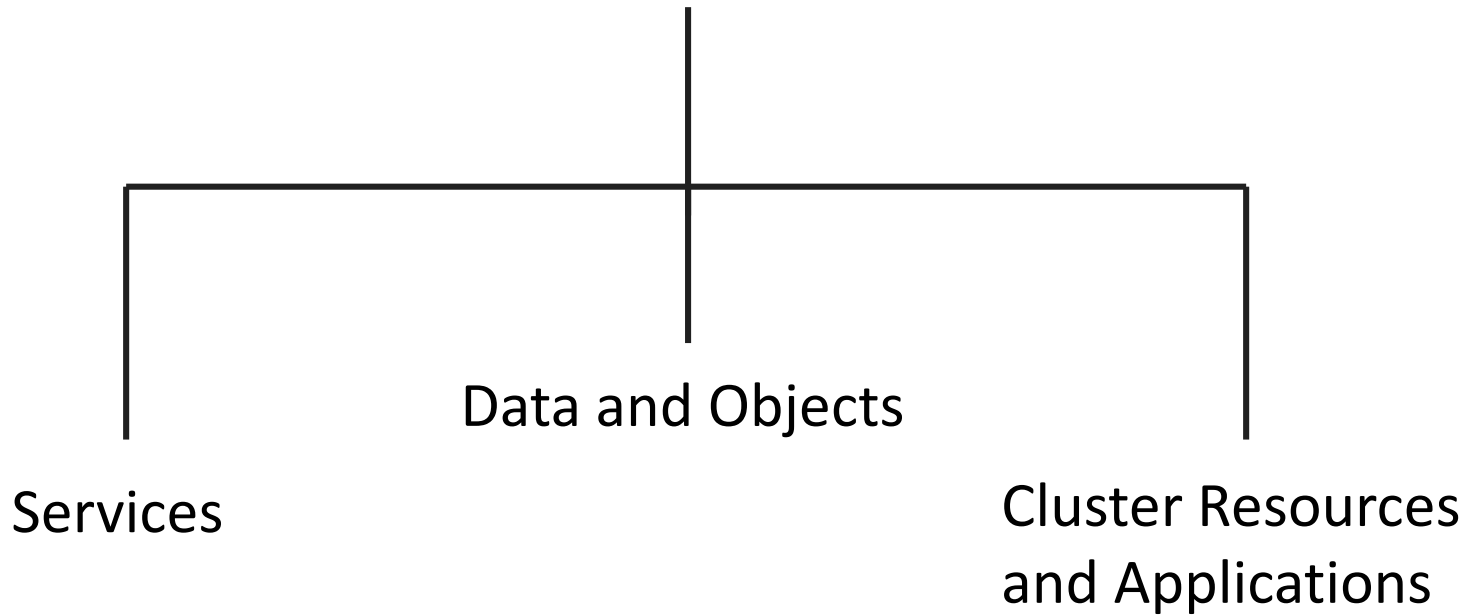
Prof. Ravi Sandhu

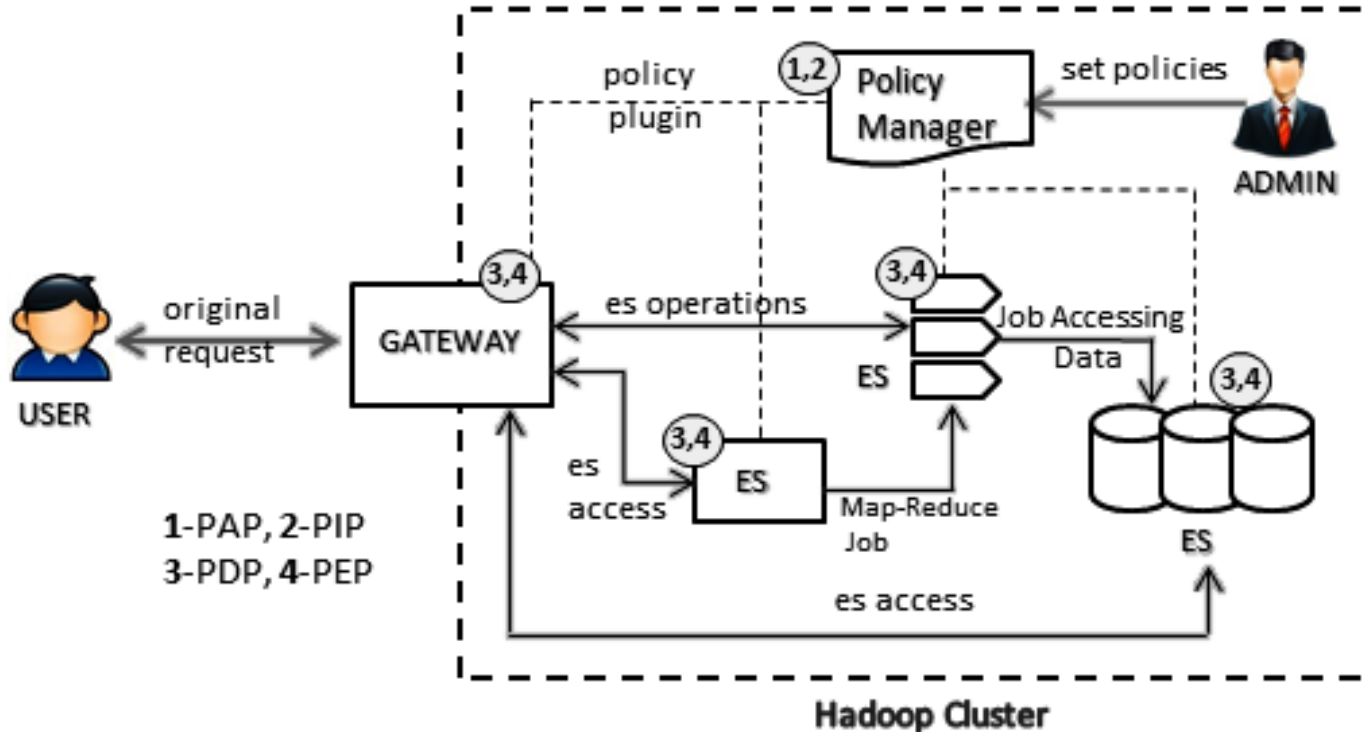
Executive Director and Endowed Chair
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Ford EEIT & GDIA
Big Data Access Control Symposium
Dearborn, Michigan
May 2, 2017





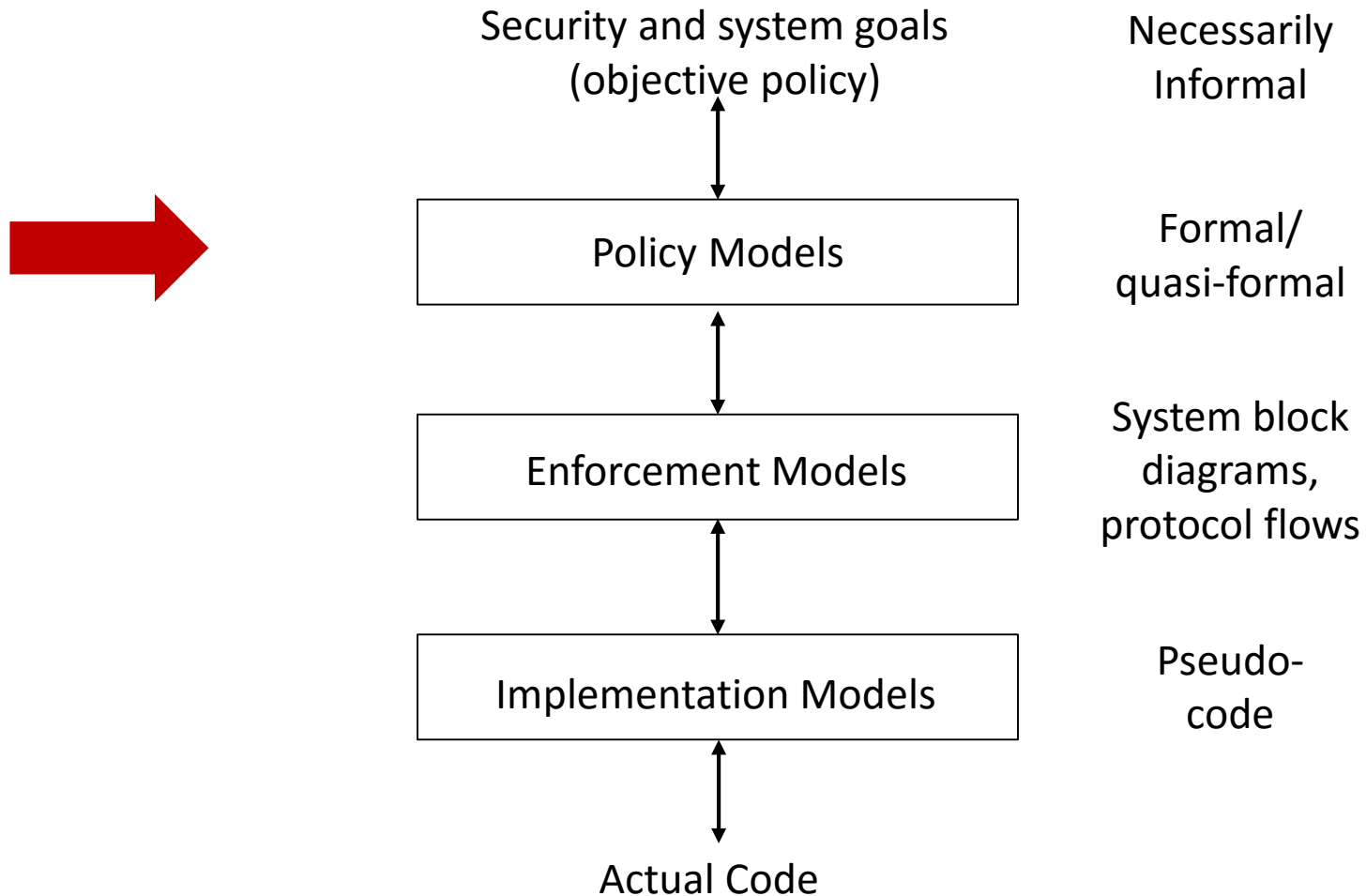


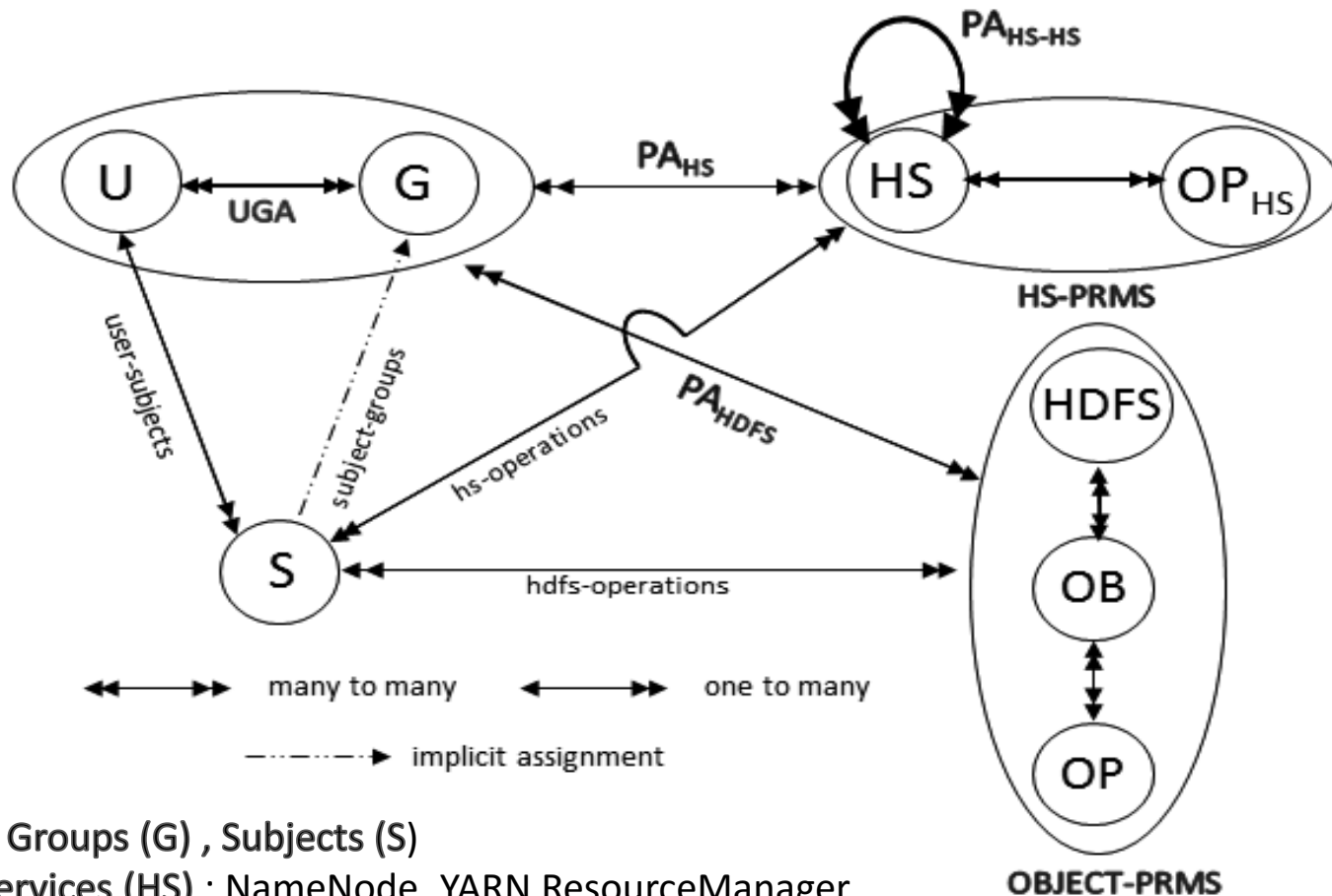


Policy Manager : Apache Ranger, Apache Sentry

Gateway : Apache Knox

Ecosystem Service (ES) : Apache Hive, HDFS, Apache Storm, Apache Kafka, YARN





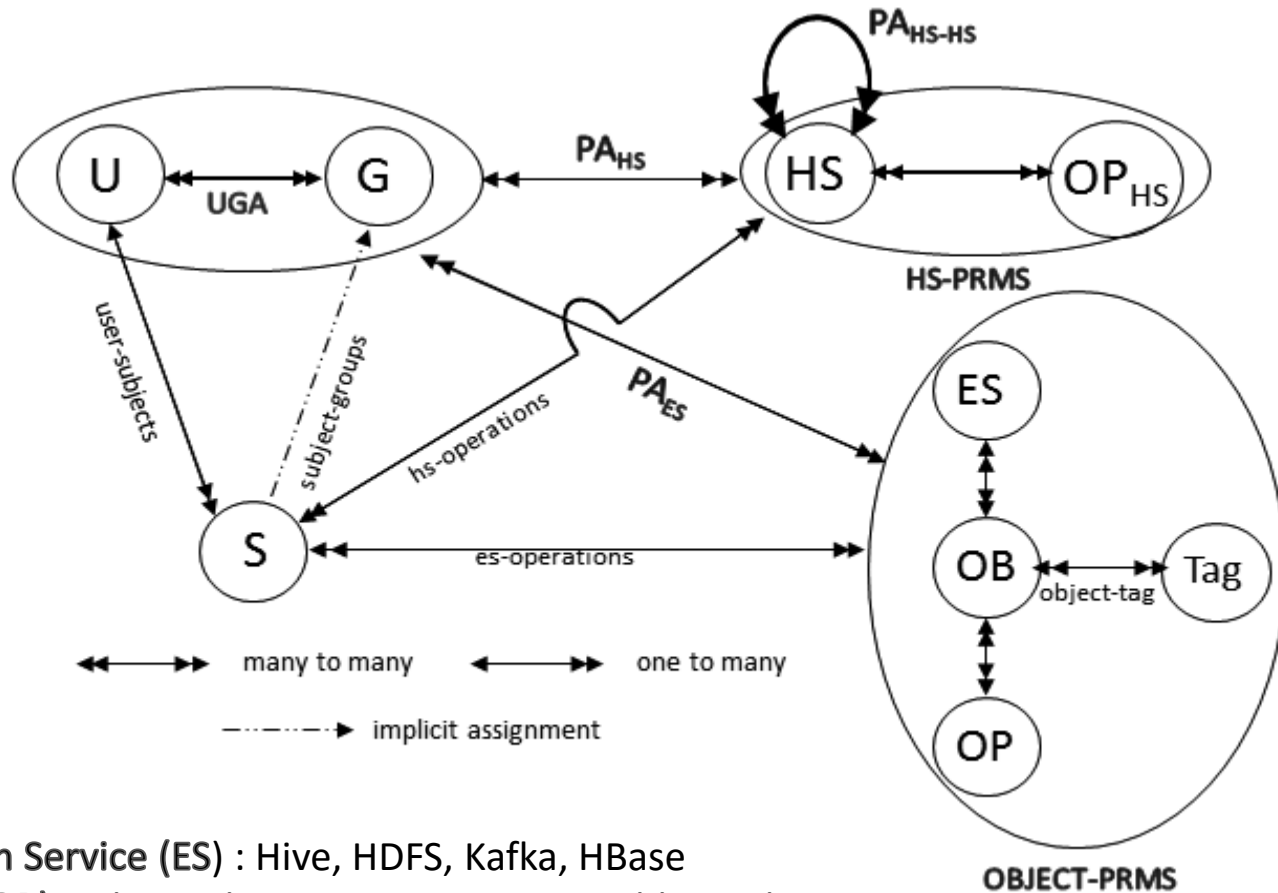
Users (U), Groups (G) , Subjects (S)

Hadoop Services (HS) : NameNode, YARN ResourceManager

Hadoop Service Operations (OP_{HS}) : access / communicate

Objects (OB) : Files and Directories in HDFS

Operations (OP) : read, write, execute

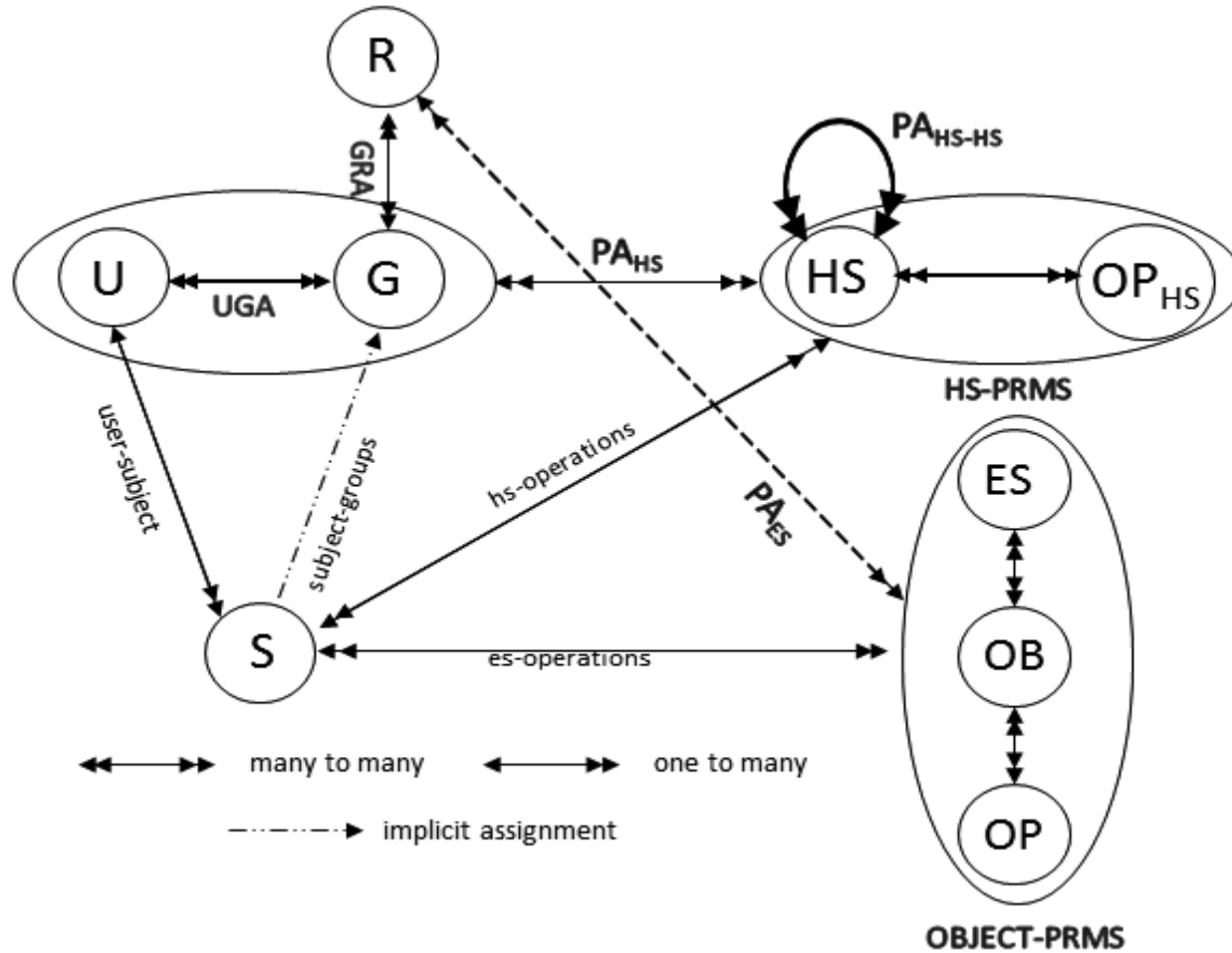


Ecosystem Service (ES) : Hive, HDFS, Kafka, HBase

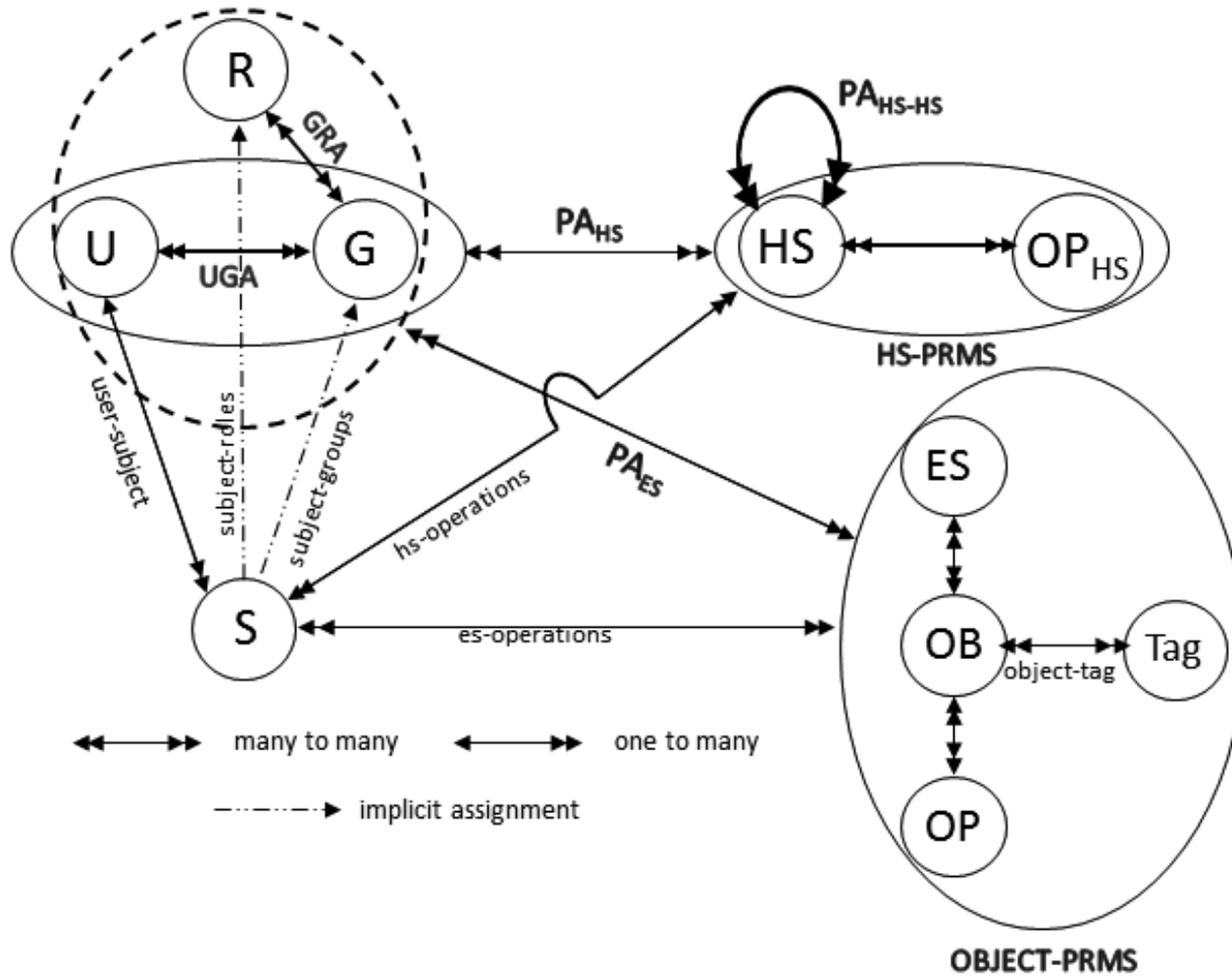
Objects (OB) : Files and Directories in HDFS; Tables, columns in Hive

Operations (OP) : read, write, execute, select, create

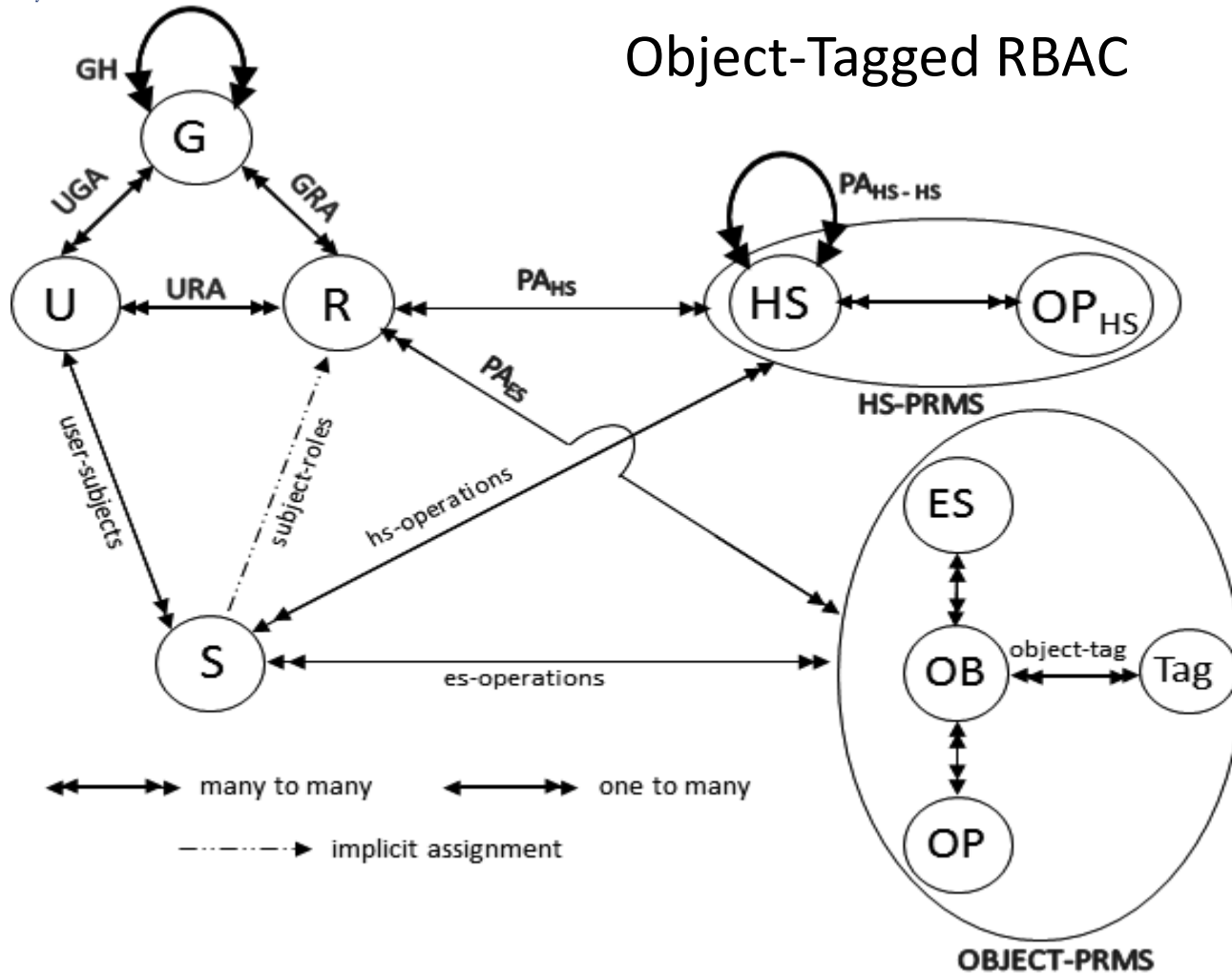
Tag : PII, top-secret

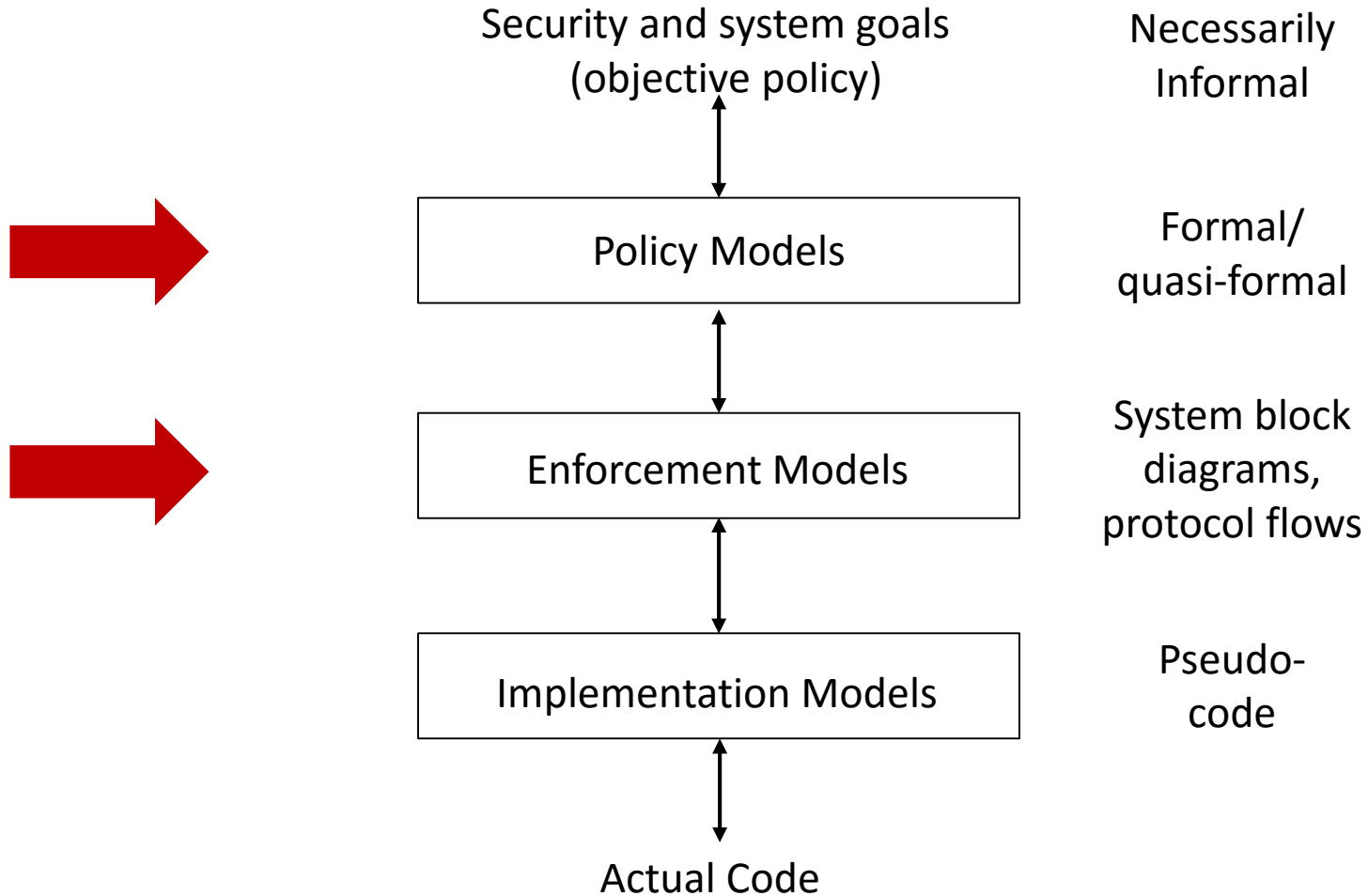


Roles (R)



Object-Tagged RBAC





- ❑ Gupta, M., Patwa, F., and Sandhu, R.: Object-Tagged RBAC Model for the Hadoop Ecosystem. In: Proc. of 31st Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec), Philadelphia, PA, July 19-21, 2017.
Available soon at http://www.profsandhu.com/conference_papers.htm
- ❑ Gupta, M., Patwa, F., Benson, J., and Sandhu, R.: Multi-layer Authorization Framework for a Representative Hadoop Ecosystem Deployment. In: Proc. of 22nd ACM Symposium on Access Control Models and Technologies (SACMAT), Indianapolis, IN, June 21-23, 2017.
<http://profsandhu.com/confrenc/misconf/sacmat17-maanak.pdf>
- ❑ Sandhu, R.: The PEI Framework for Application-Centric Security. In: Proc. 5th IEEE International Conference on Collaborative Computing: Networking, Applications and Worksharing (CollaborateCom), Crystal City, Virginia, November 11-14, 2009.
http://profsandhu.com/confrenc/misconf/collabcom09_pei.pdf