

Attribute-Based Access Control (ABAC)

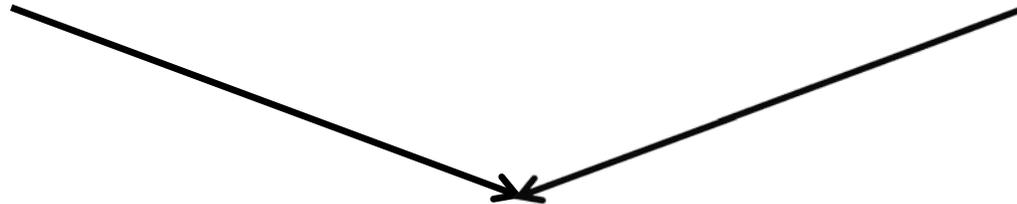
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**Discretionary Access Control
(DAC), 1970**

**Mandatory Access Control
(MAC), 1970**

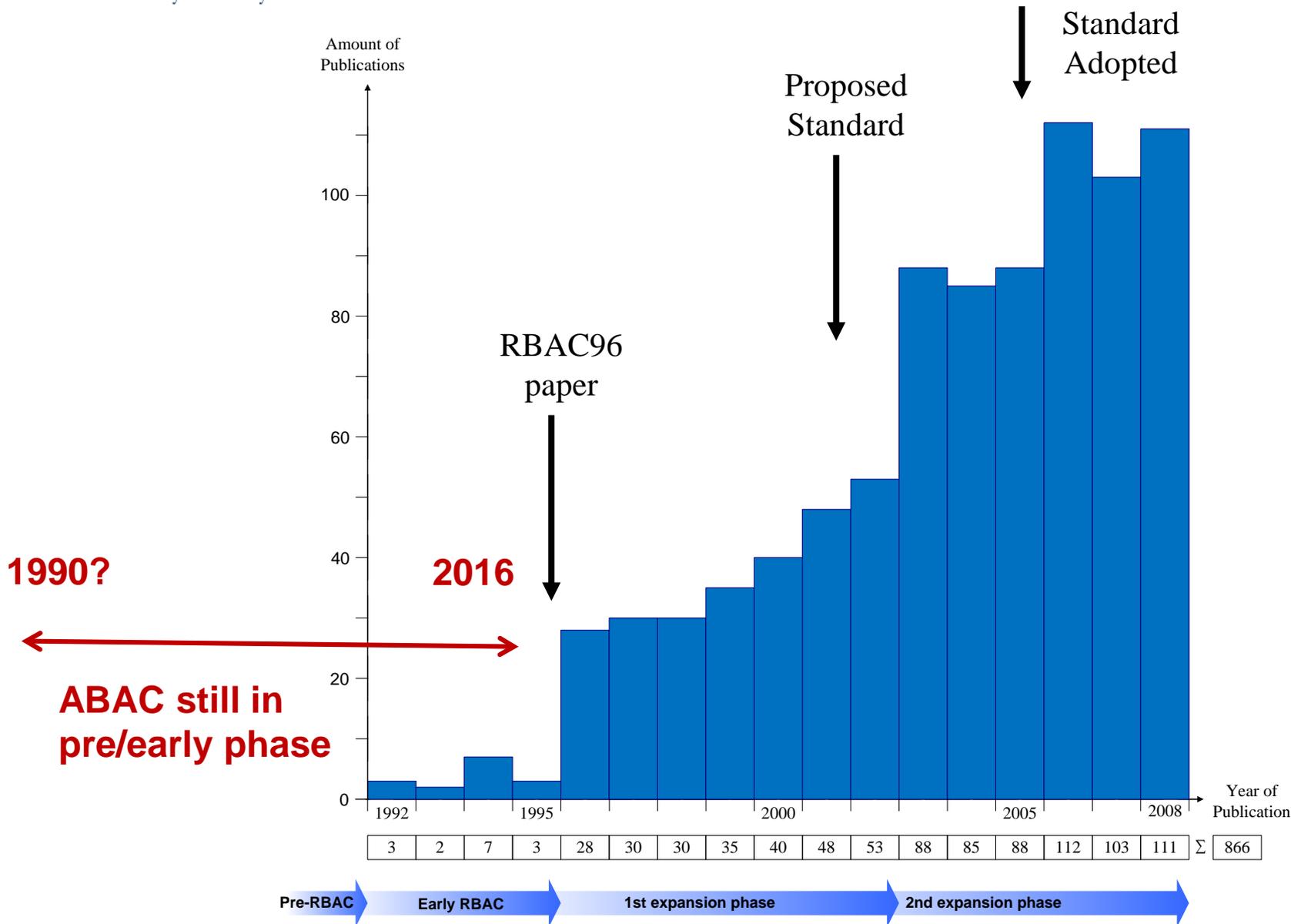


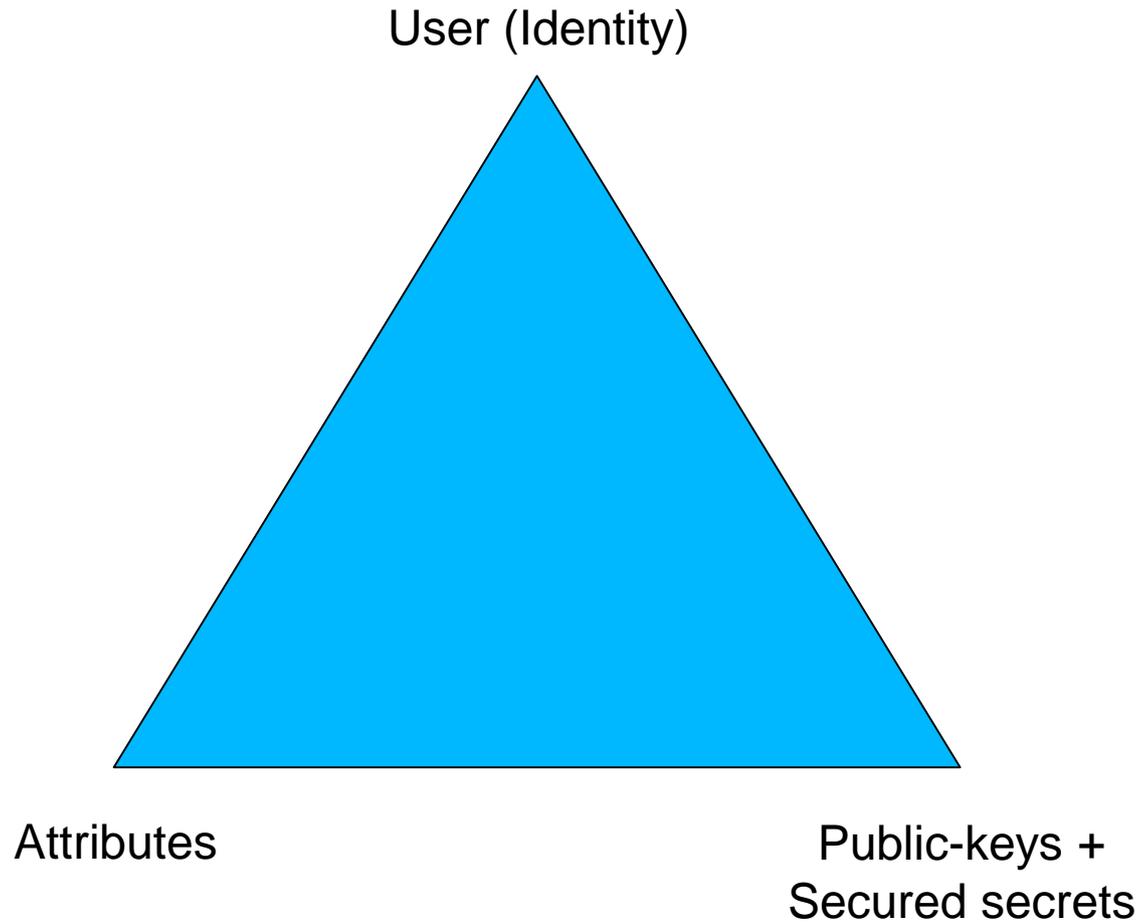
**Role Based Access Control
(RBAC), 1995**

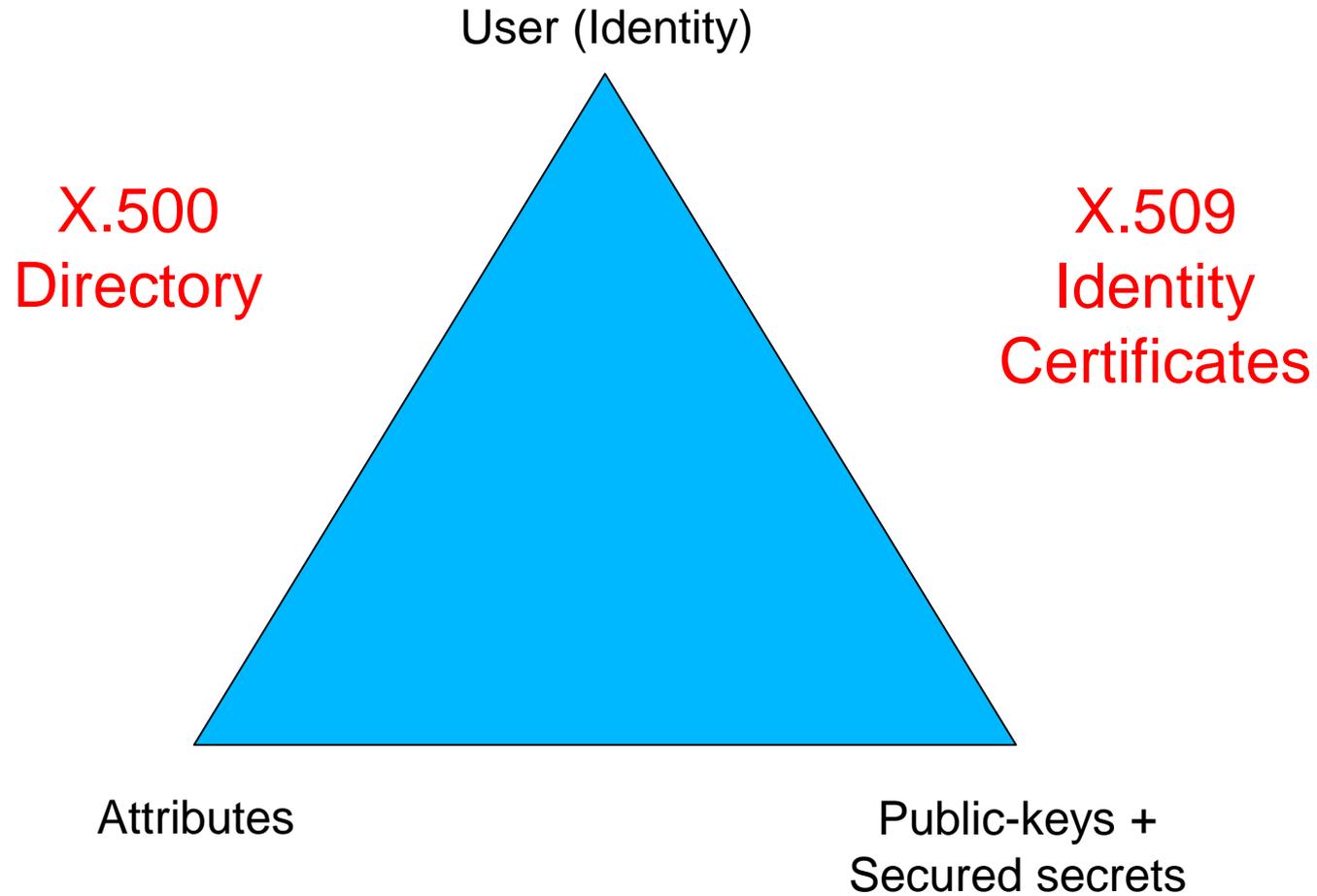


**Attribute Based Access Control
(ABAC), ????**

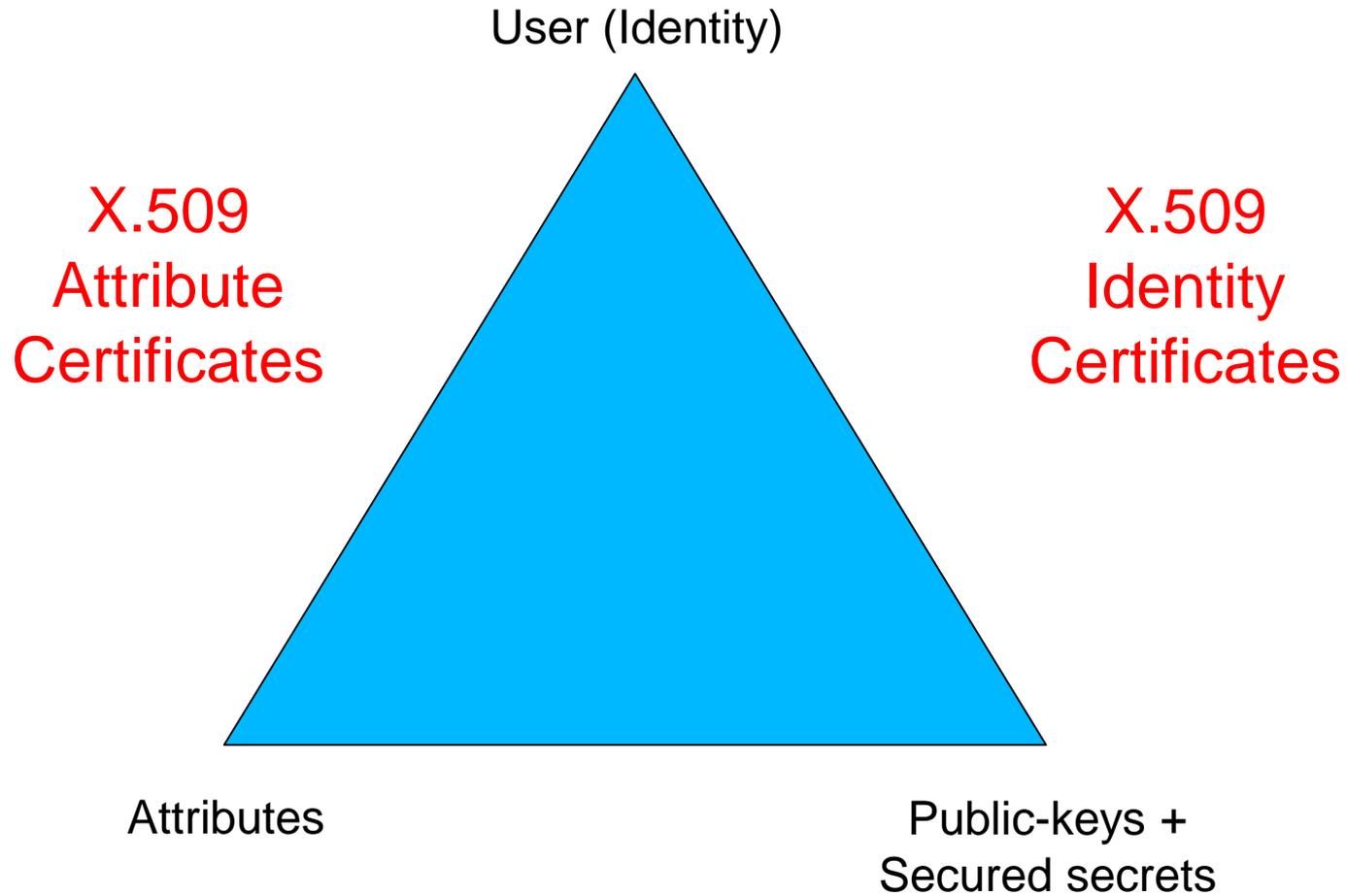
Discuss Figs 2 and 3 of NIST SP 800-162



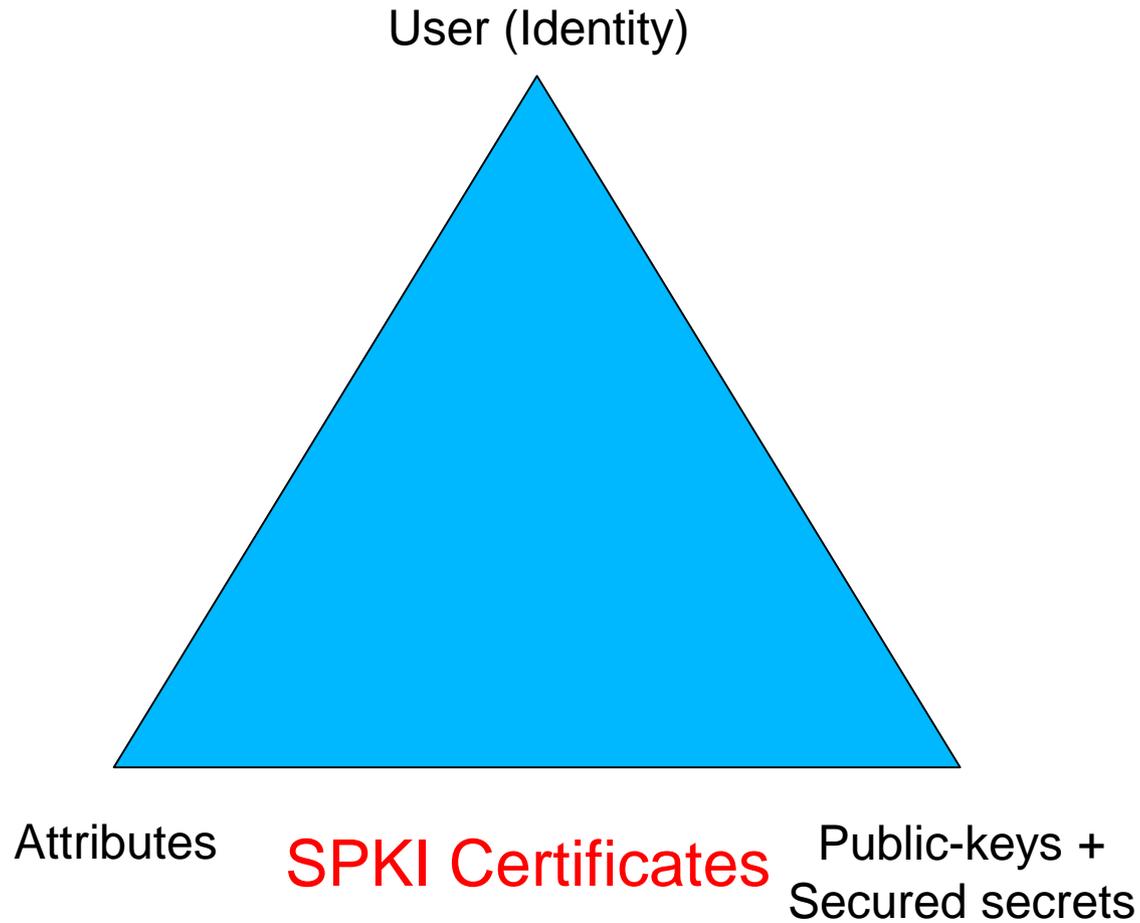




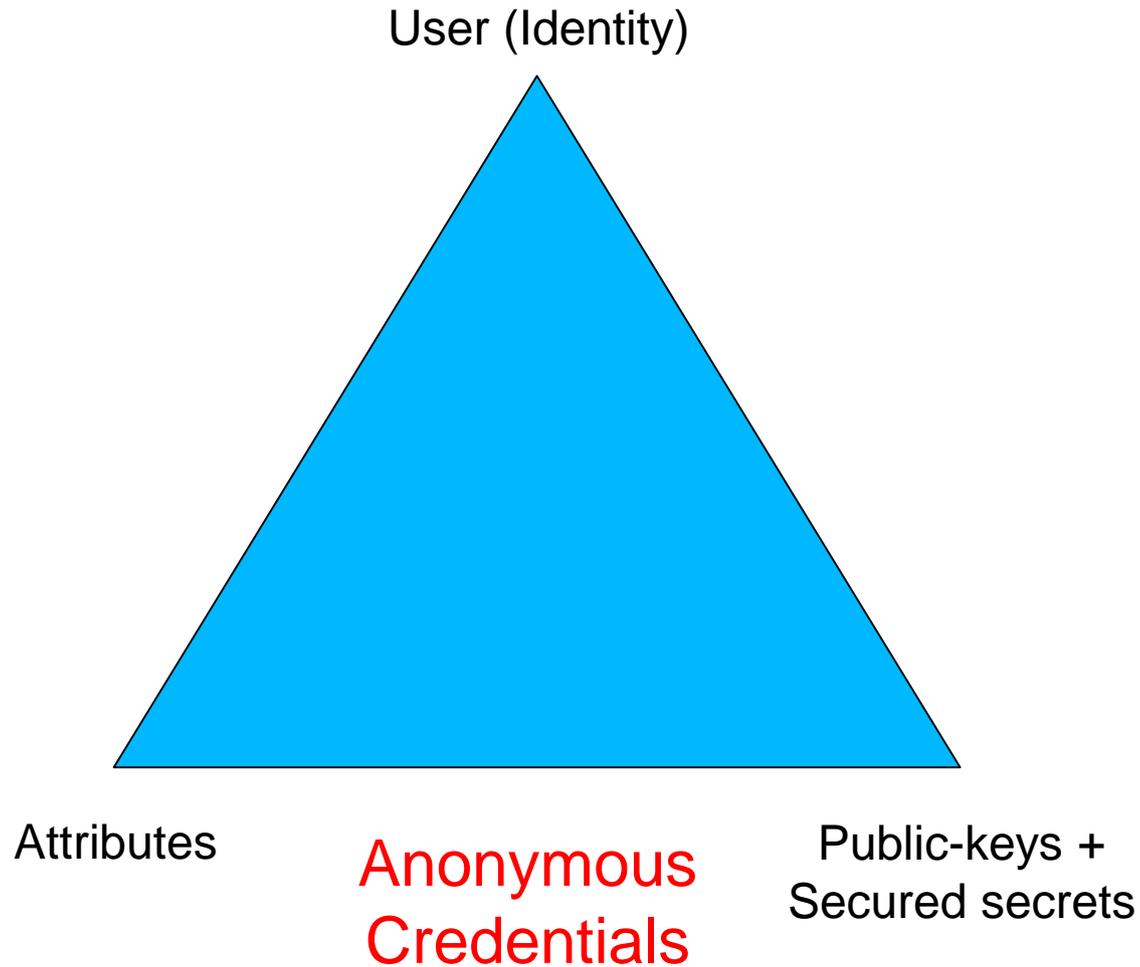
Pre Internet, early 1990s



Post Internet, late 1990s

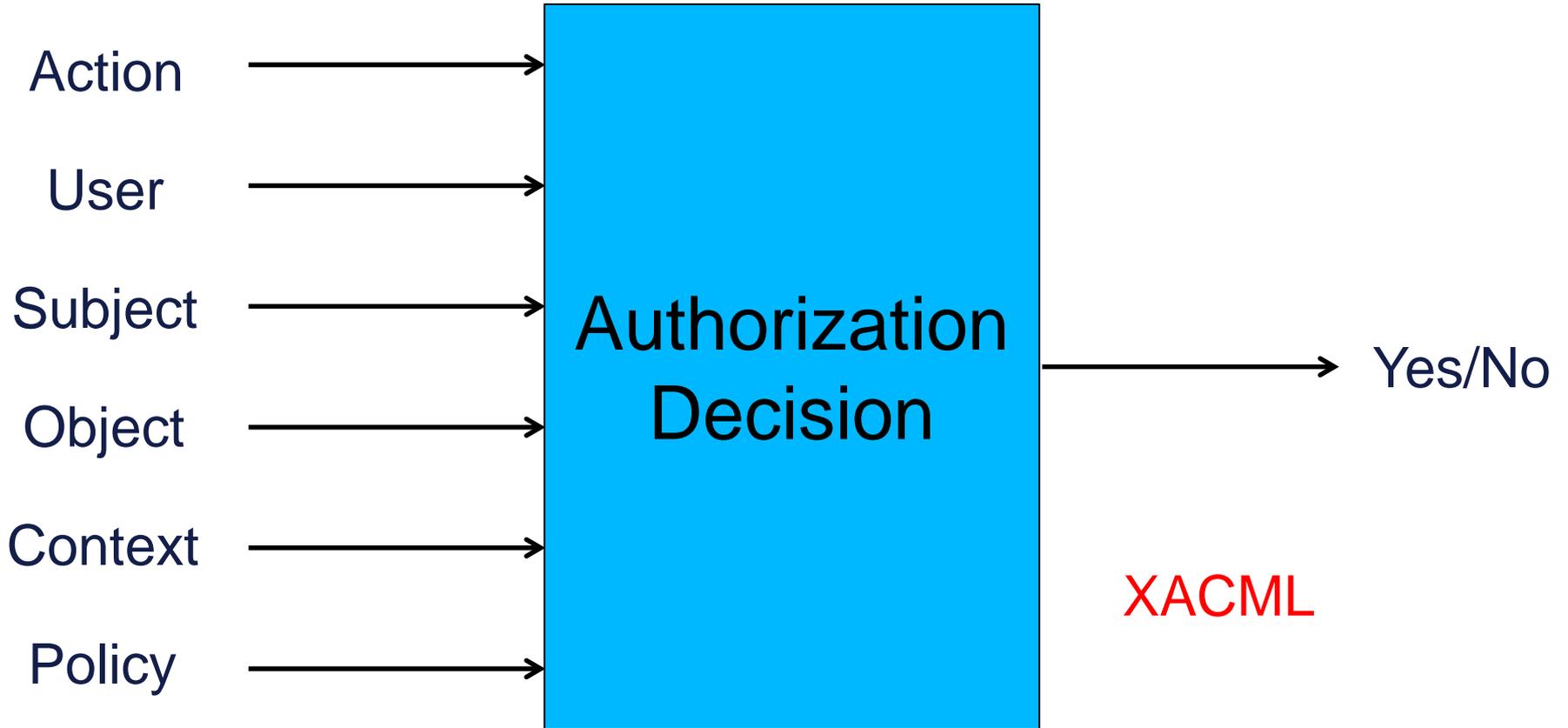


Post Internet, late 1990s



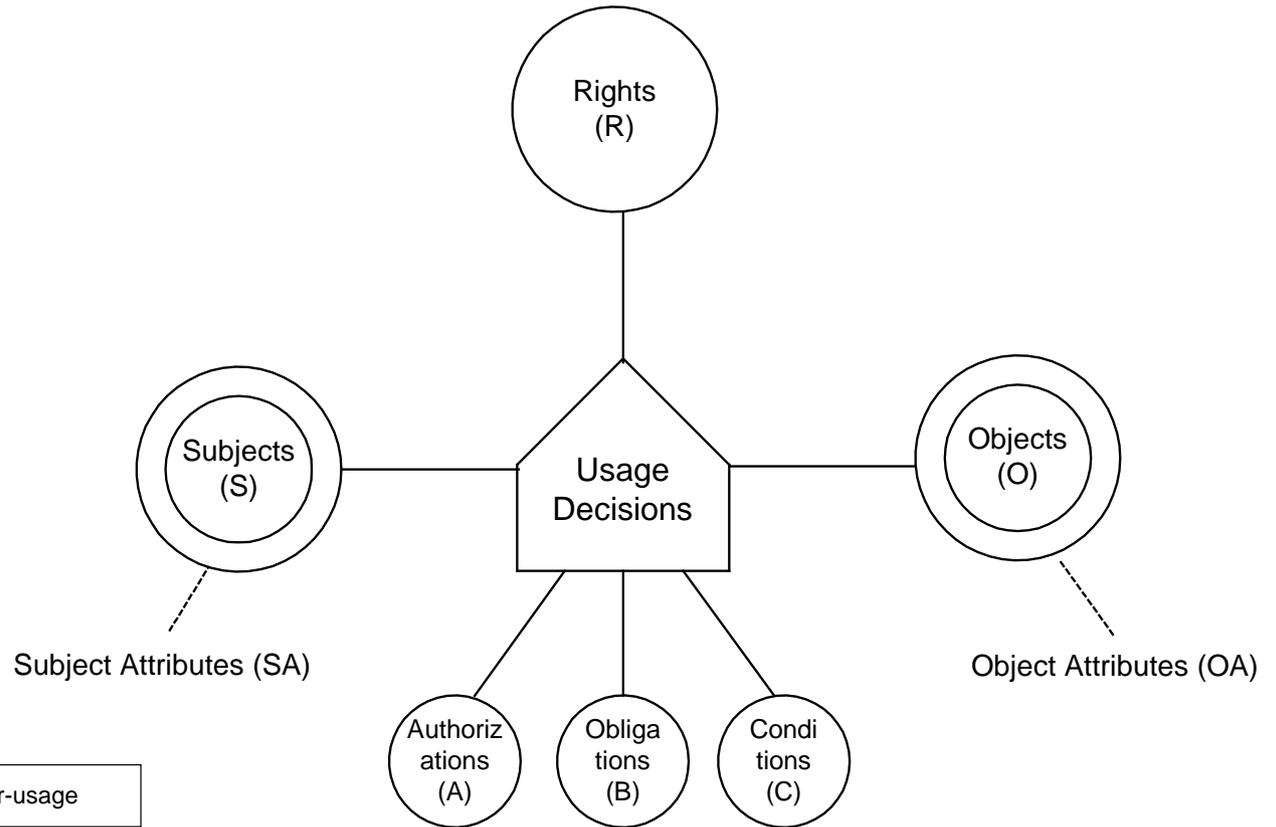
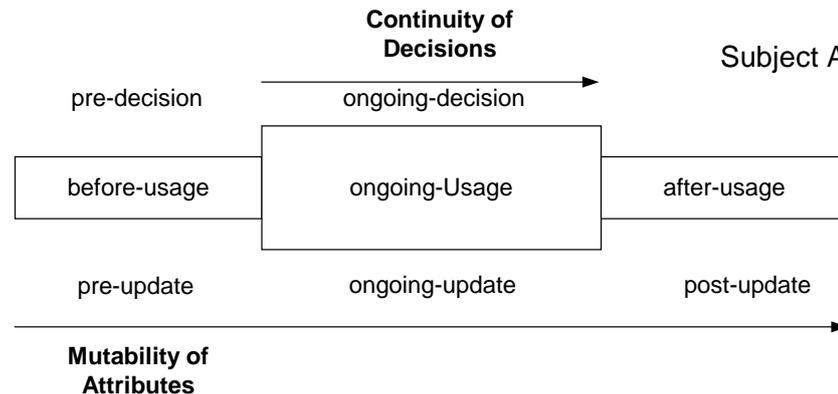
Mature Internet, 2000s

Attributes

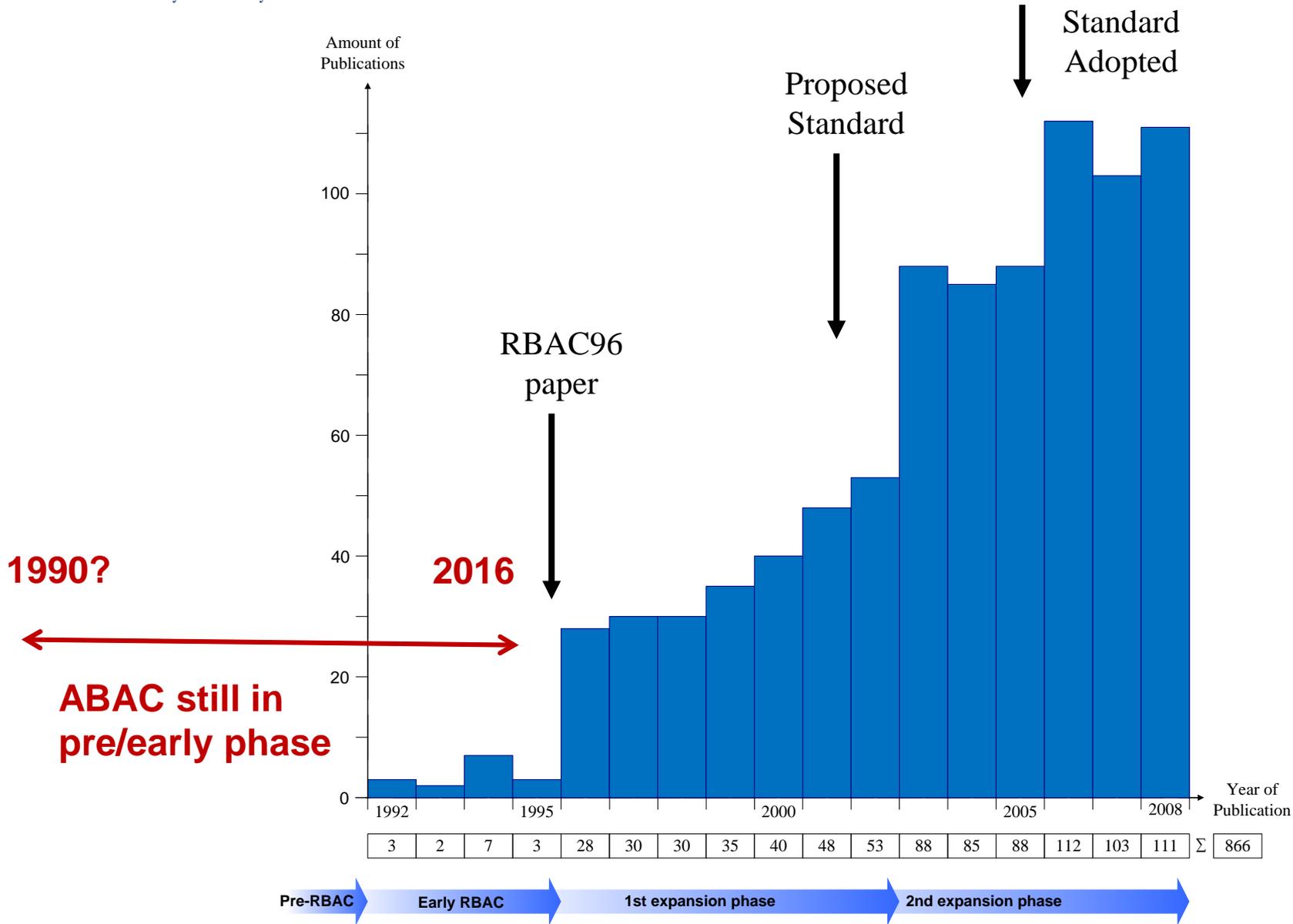


Mature Internet, 2000s

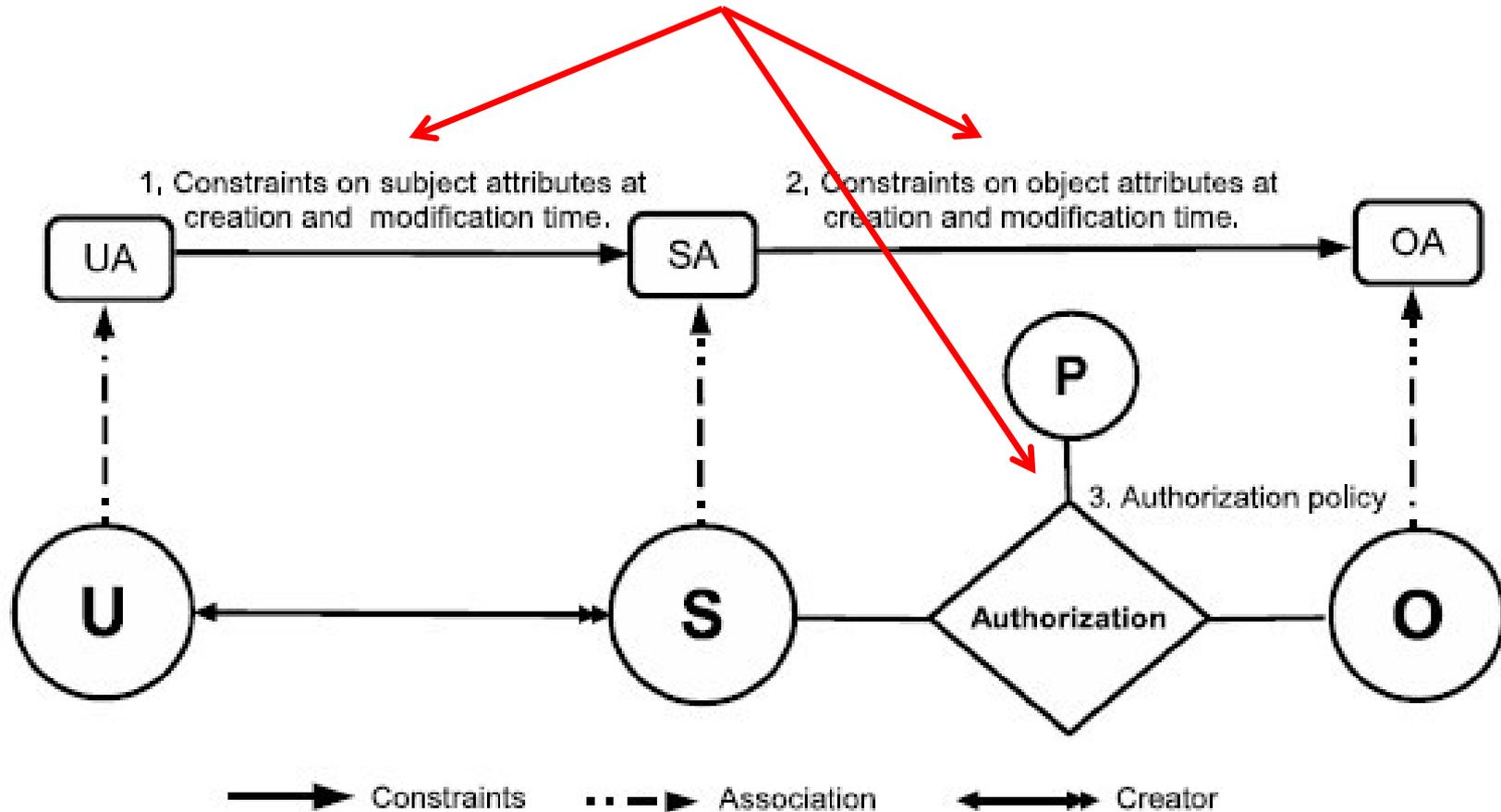
- unified model integrating
 - authorization
 - obligation
 - conditions
- and incorporating
 - continuity of decisions
 - mutability of attributes



**Usage Control Models, early 2000s
ABAC on steroids**



Policy Configuration Points



**Can be configured to do simple forms of
DAC, MAC, RBAC**

Discuss highlights of Jin 2012 paper

1, 2, 4, 5

Extended Constraints on Role Activation:

Attribute-Based User-Role Assignment- 2002 [6], OASIS-RBAC-2002 [9], SRBAC-2003 [46], Rule-RBAC-2004 [5], GEO-RBAC-2005 [16]

1,4

Extended Concept of Role:

Role Template-1997 [45], Parameterized RBAC-2004 [2], Parameterized RBAC-2003 [34], Parameterized Role-2004 [43], Attributed Role-2006 [99]

1, 4, 5

Changes in Role-Permission Relationship:

Task-RBAC-2000 [77], Task-RBAC-2003 [78]

4, 5

Organization and Team:

Relationship-RBAC -1997 [12], TeamMAC-1997 [87], TeamMAC-2004 [7], ROBAC-2006 [103], Group-RBAC-2009 [66], RABAC-2013 [51], Domain-RBAC -2013 [98]

4

1, 4, 5

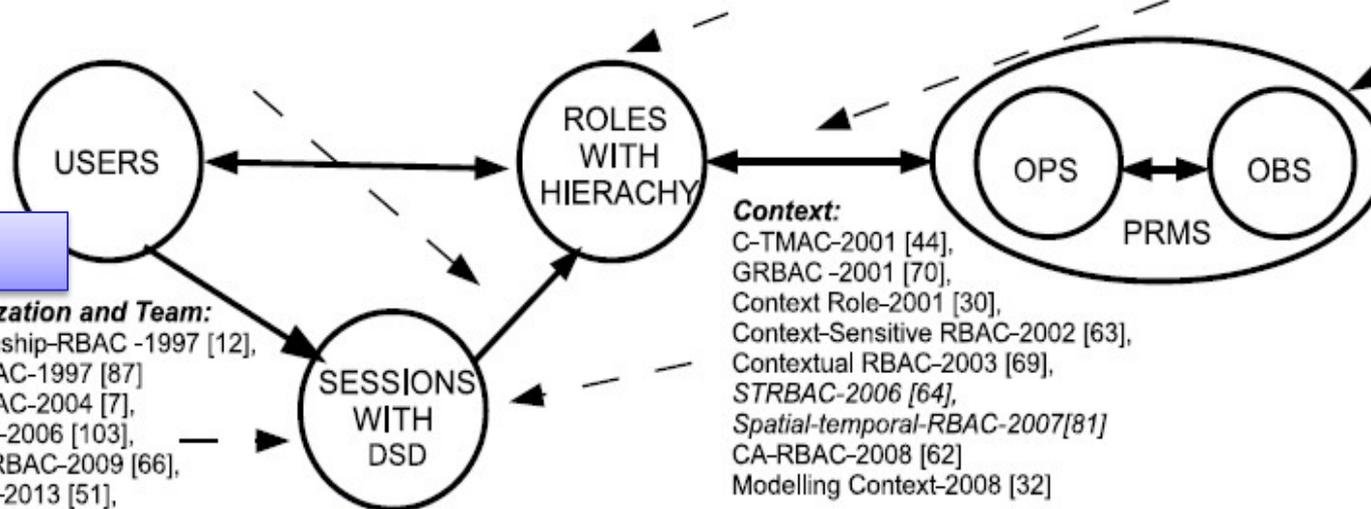
Context:

C-TMAC-2001 [44], GRBAC -2001 [70], Context Role-2001 [30], Context-Sensitive RBAC-2002 [63], Contextual RBAC-2003 [69], STRBAC-2006 [64], Spatial-temporal-RBAC-2007[81], CA-RBAC-2008 [62], Modelling Context-2008 [32]

Extended Permission Structure:

RBAC with Object class- 2007 [24], Conditional PRBAC 07 [74], PRBAC 07 [75], Purpose-aware RBAC- 2008 [67], Ubi-RBAC-2010 [76], RCPBAC-2011 [55]

1, 2, 3, 4, 5



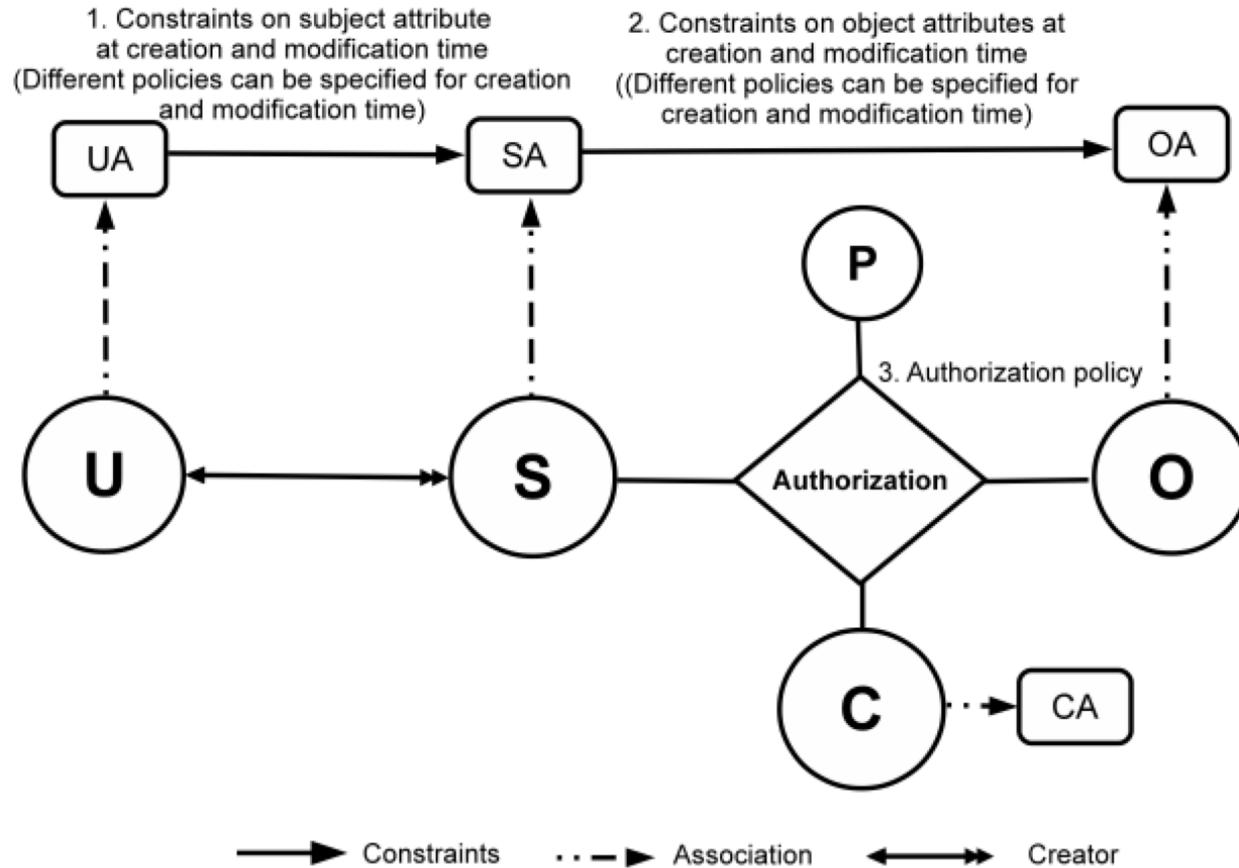
1. Context Attributes

2. Subject attribute constraints policy are different at creation and modification time.

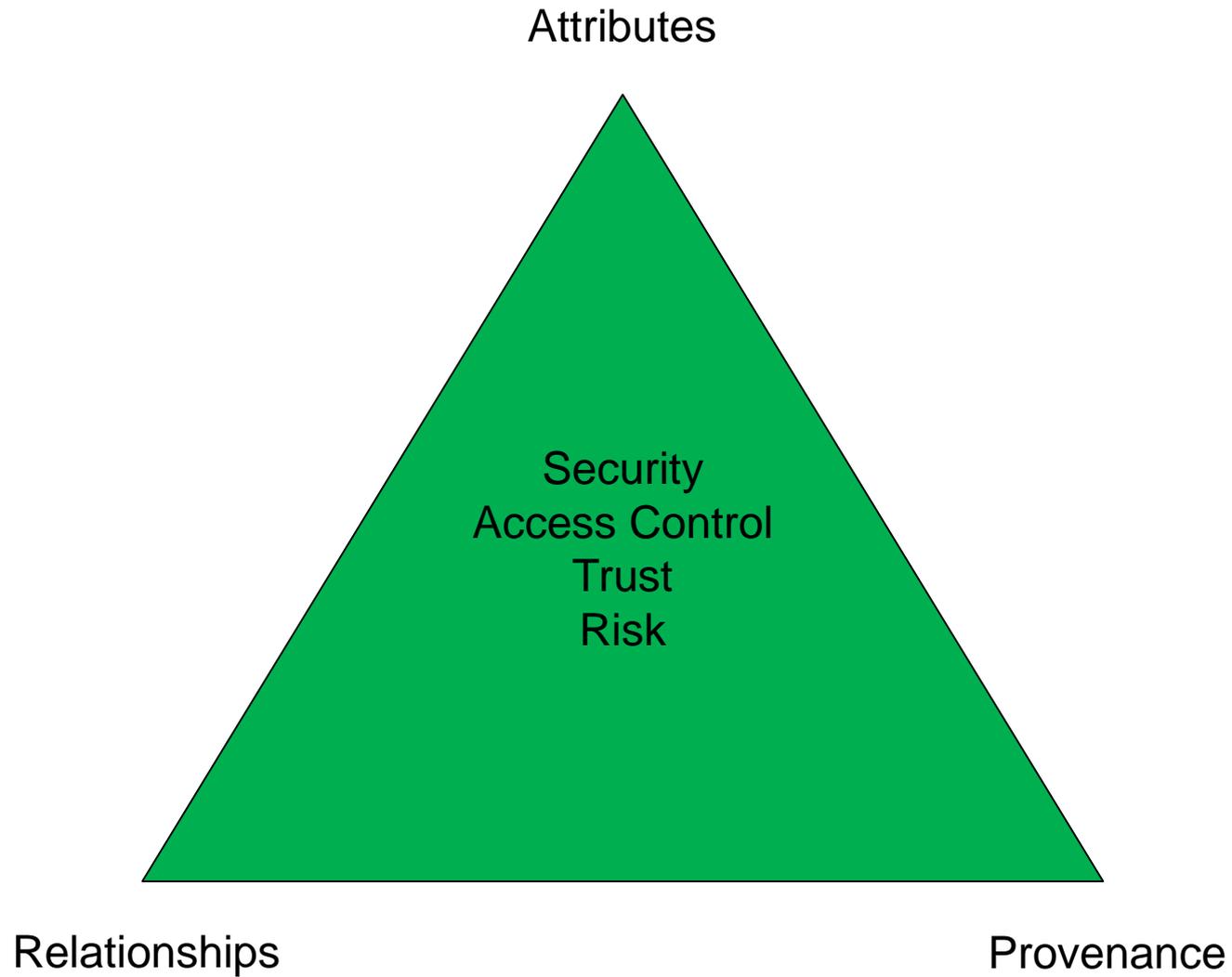
3. Subject attributes constrained by attributes of subjects created by the same user.

4. Policy Language

5. Meta-Attributes



Can be configured to do many RBAC extensions



- Cloud computing
- Internet of Things
-

Discuss Fig 1 of Kandala 2011 paper

Discuss Fig 1 and Table 1 of Hu 2015 paper

Discuss Kuhn 2010 paper