Certificate Root Stores - An Area of Unity or Disparity?

Jegan Purushothaman, Ethan Thompson, AbdelRahman Abdou

Carleton University

Background

- Certificates
- Certificate Issuance
- Certificate Validation
- Certificate Root Stores

Our Work

Focus

- # of unique certificates
- # of unique organizations
- Inclusion policies
- Method of delivery
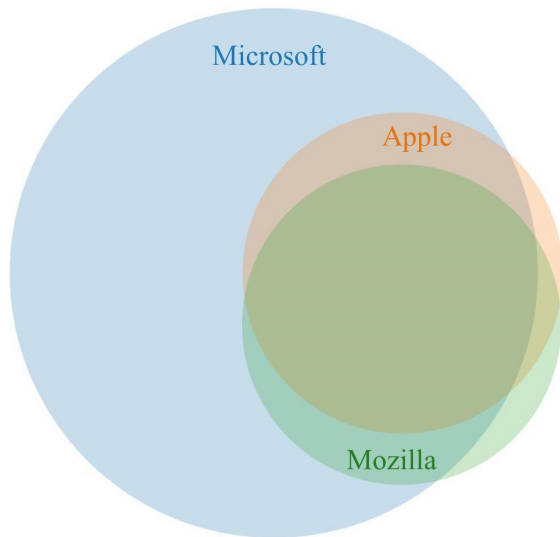- Certificate usage

Focus

- **# of unique certificates**
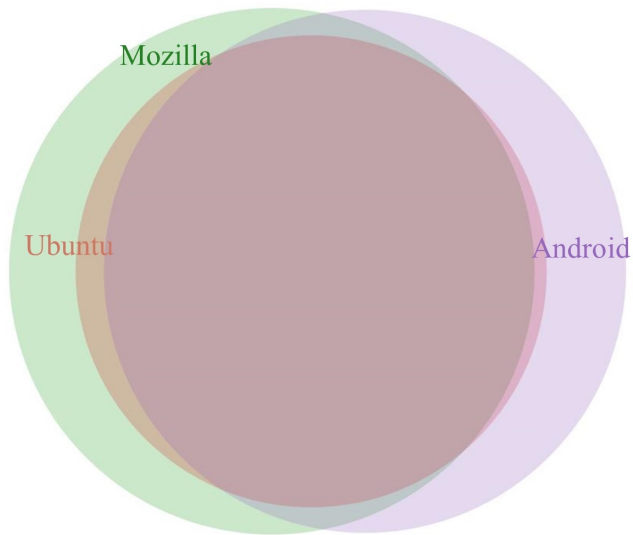- **# of unique organizations**
- **Inclusion policies**
- Method of delivery
- Certificate usage

Root Certificate Overlaps

Vendor	# of Certs	# Exclusive
Microsoft	432	247
Apple	159	7
Mozilla	158	10

- Total of 503 unique certificates
- 25% overlap between vendors

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Root Certificate Overlaps

Vendor	# of Certs	# Exclusive
Mozilla	158	10
Ubuntu	127	0
Android	156	11

Organization Overlaps

Root Organizations Overlaps
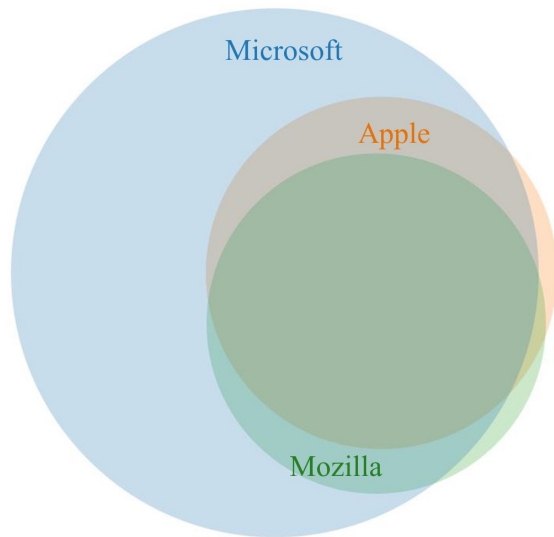
Vendor	# of Orgs	# Exclusive
Microsoft	133	69
Apple	59	0
Mozilla	55	2

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Root Organizations Overlaps
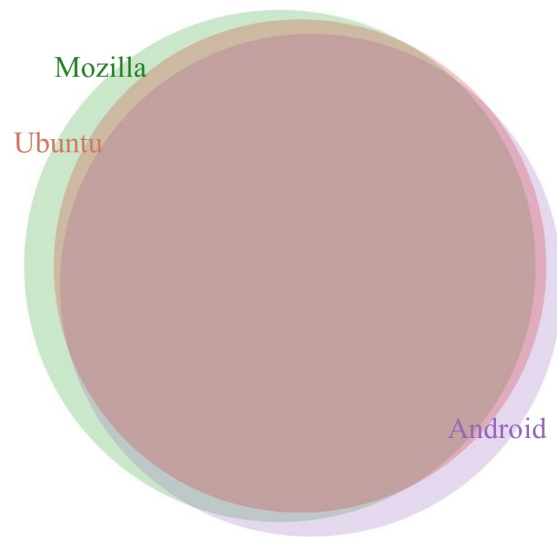
Vendor	# of Orgs	# Exclusive
Mozilla	55	2
Ubuntu	51	0
Android	53	1

Government Organization Overlaps
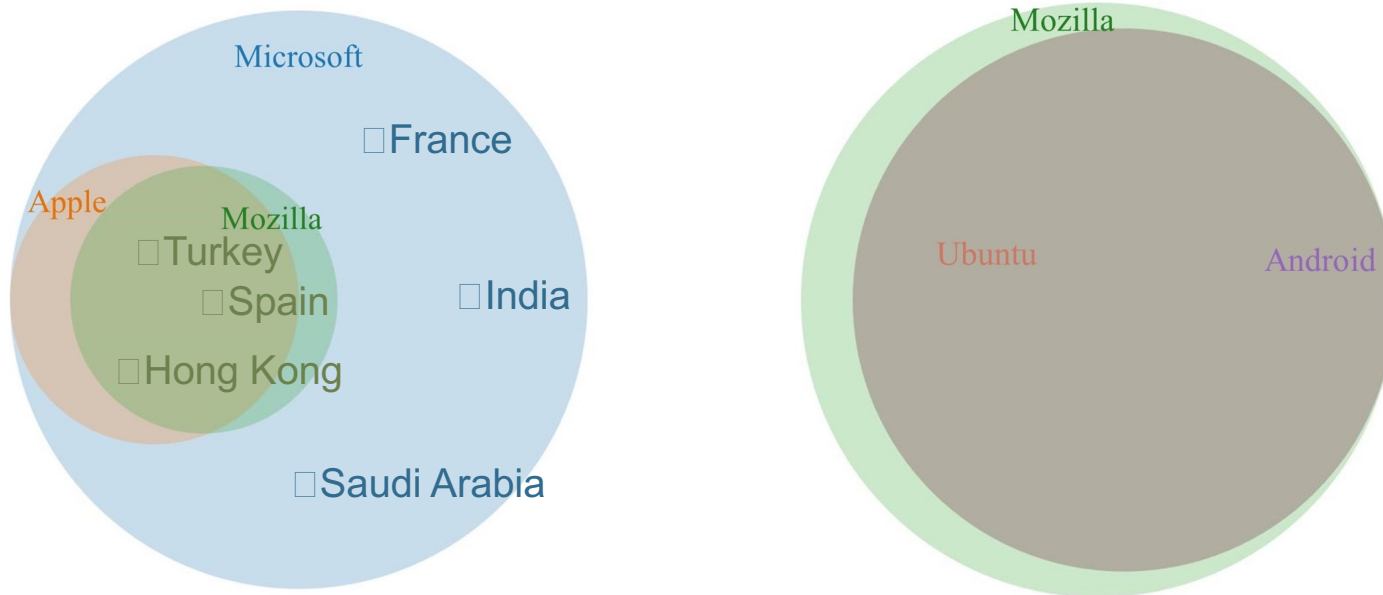
Policies

Impact of Root-Store Differences on Leaf Certs

	Microsoft	Apple	Mozilla
Total Certs Trusted	585,595	585,567	584,854
Exclusively Trusted	26	1	0

Conclusion

- Despite the Censys data, trust disparities remain concerning

- Some differences are expected

- Left with questions

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