



# NDN Control Center

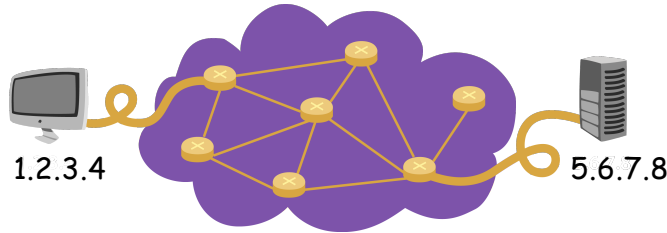
NDN Networking Stack and Security  
Enabler for Desktop Systems

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**NAMED DATA**  
**NETWORKING**

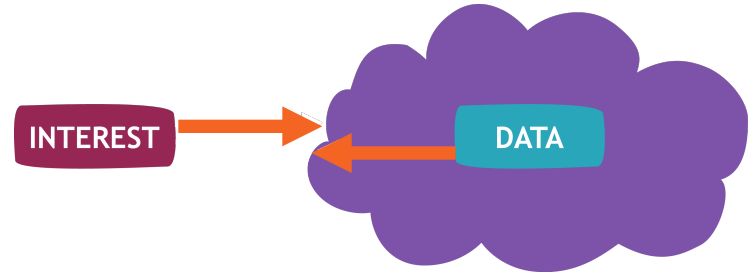
# What is the difference with IP?

**Internet Protocol (RFC791):** Focused on delivering packets to destination *node*



- Destination address
- Source address
- Meaningful static identifier

**NDN:** Focusing on retrieving *data*



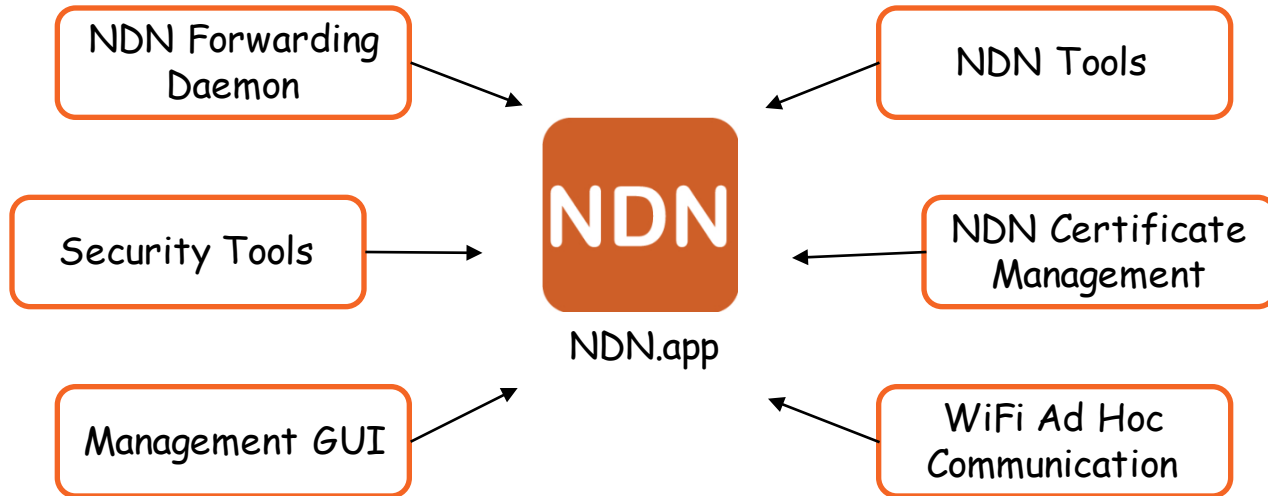
- Interest contains desired name
- Data has unique name
- Data must be secured
  - Carrying a crypto signature

# Example: enable a camera to publish data

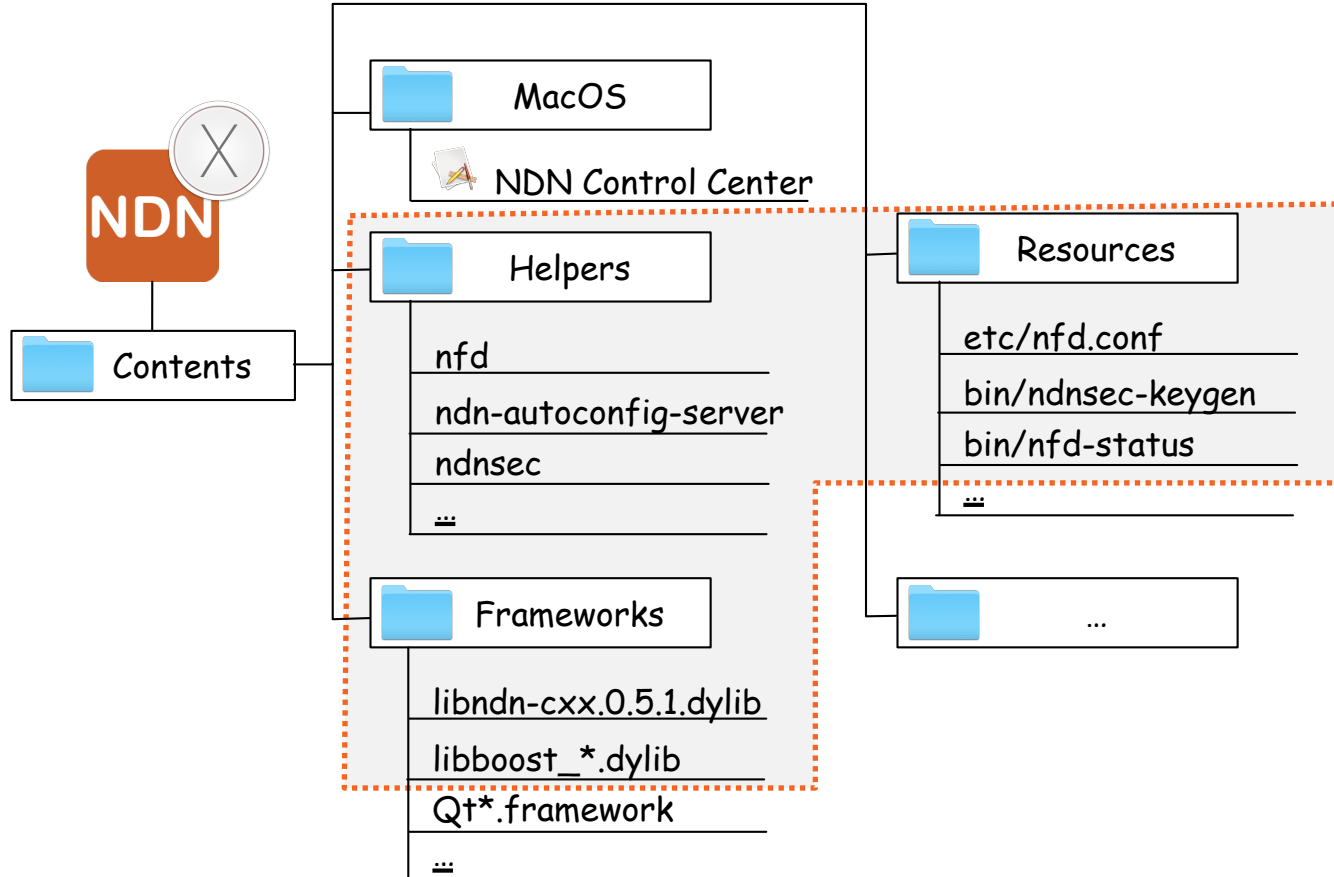


- NDN protocol stack
  - NFD: for network connectivity
- Routing configuration
  - Discovery of local hub & prefixes
  - Local data prefixes propagation
- **Identity/Certificate**
  - Sign Data with the certificate corresponded to identity

# NDN.app: NDN Stack for macOS

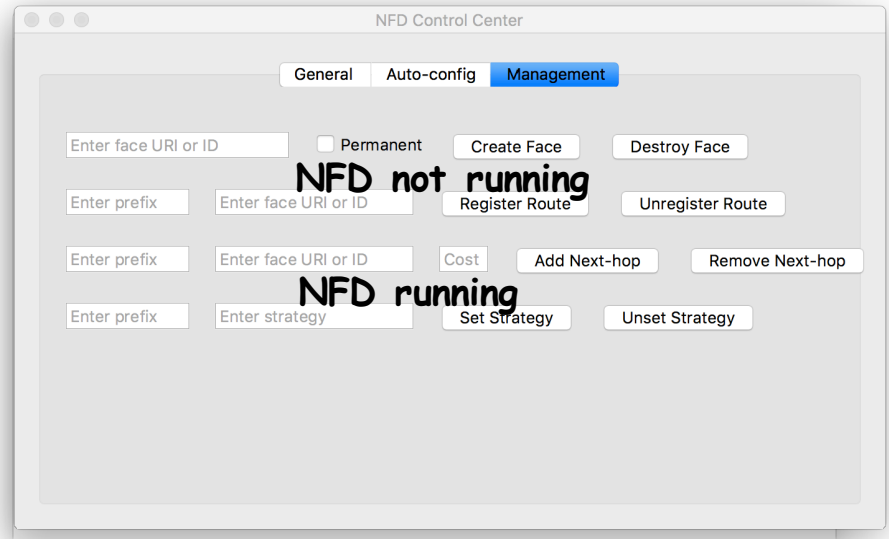
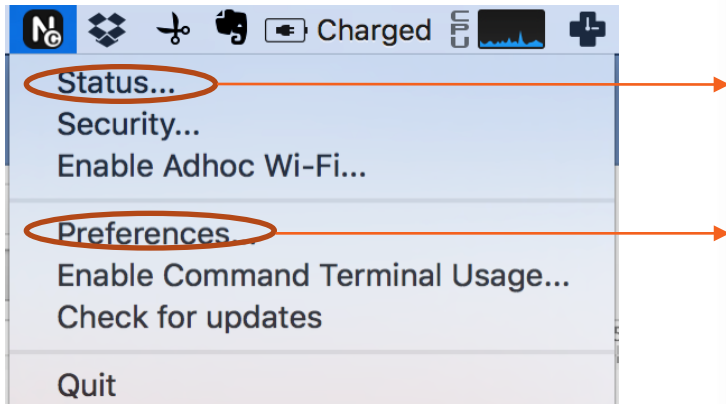


# What's Inside NDN.app?



# Enabling NDN on macOS

- System automatically starts NDN-CC, NDN-CC starts NFD
- Monitor status & change parameters of local NFD



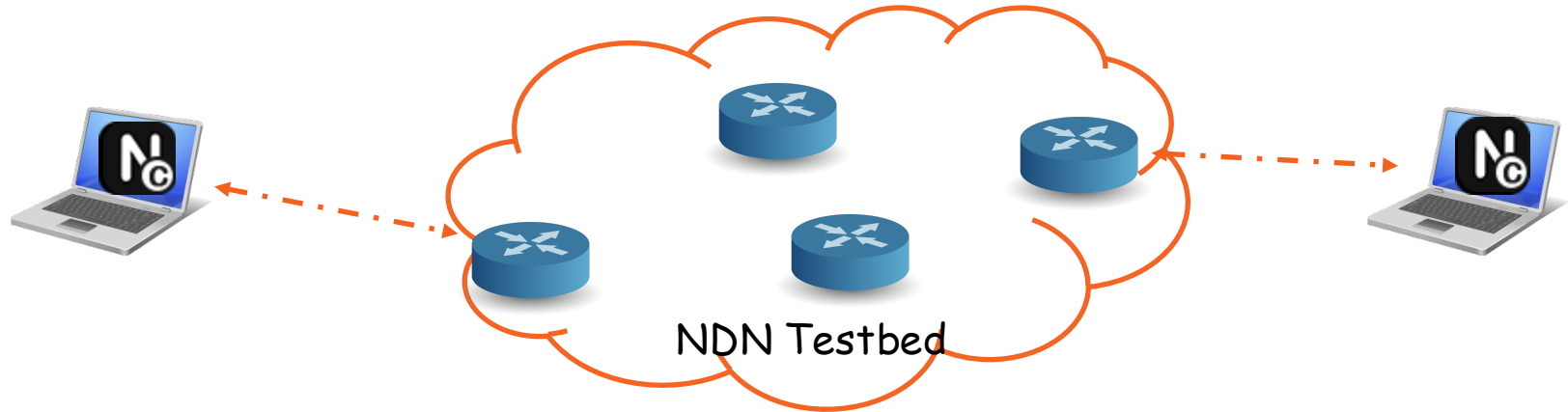
# Enabling Local NDN communication

- NDN Control Center supports ad hoc WiFi communication
  - Click "Enable ad hoc WiFi" menu entry
  - Use multicast face as default



# Enabling Global NDN Communication

- NDN-CC automatically starts NDN auto-configuration daemon to discover nearby NDN hub & maintain the connectivity

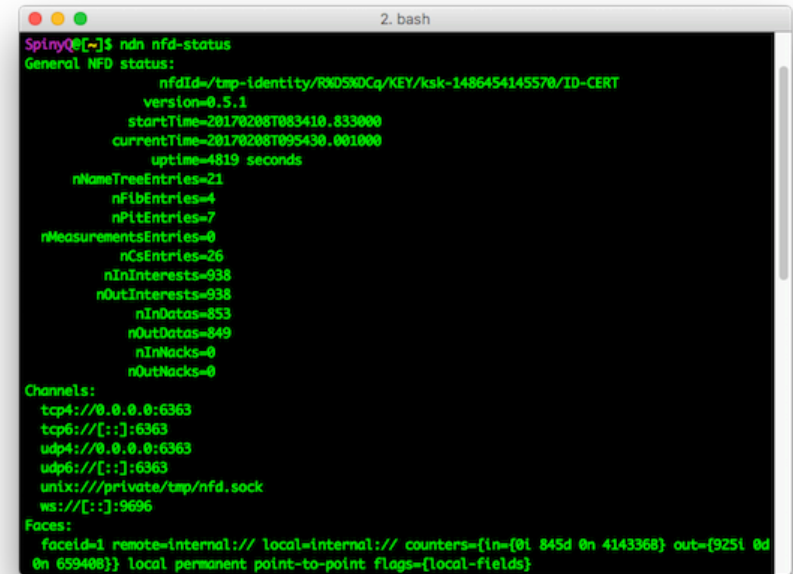




# Enabling Command-line tools

- NDN Control Center bundles various command-line tools
  - NFD and supporting tools
  - NDN tools
  - Security tools

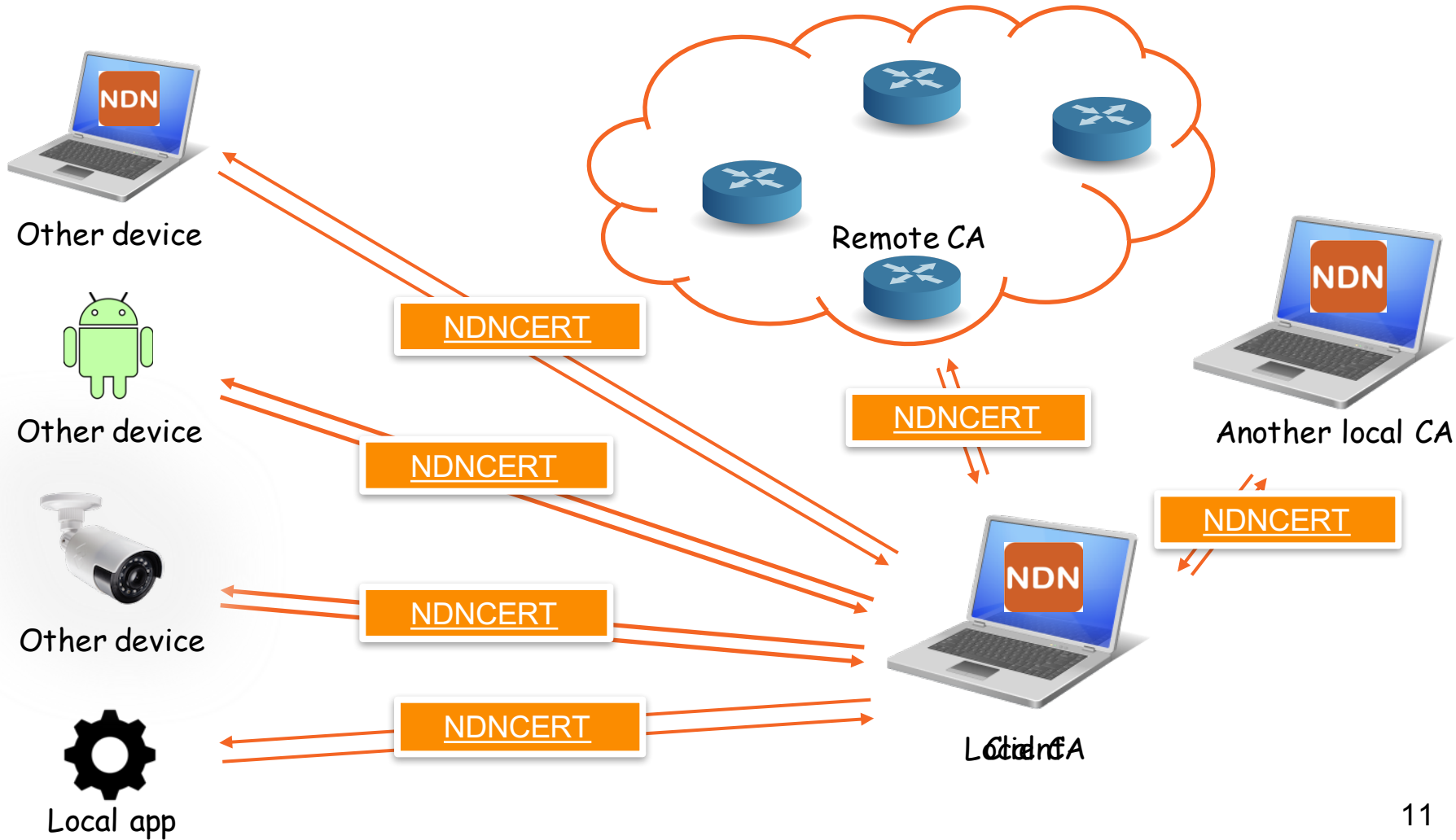
NFD	nfd	nfd-status-http-server	ndn-autoconfig-server
	nfdc	nfd-autoreg	
	nfd-status	ndn-autoconfig	
NDN Tools	ndn-dissect	ndnpeek	ndnpoke
	ndncatchchunks	ndnping	ndnputchunks
	ndndump	ndnpingserver	
Security Tools	ndnsec	ndnsec-dump-certificate	ndnsec-op-tool
	ndnsec-cert-dump	ndnsec-export	ndnsec-operator-tool
	ndnsec-cert-gen	ndnsec-get-default	ndnsec-set-acl
	ndnsec-cert-install	ndnsec-import	ndnsec-set-default
	ndnsec-cert-revoke	ndnsec-install-cert	ndnsec-sig-verify
	ndnsec-certgen	ndnsec-key-gen	ndnsec-sign-req
	ndnsec-delete	ndnsec-keygen	ndnsec-unlock-tpm
	ndnsec-dsk-gen	ndnsec-list	
	ndnsec-dskgen	ndnsec-ls-identity	



```
SpinyQ@[-]$ ndn nfd-status
General NFD status:
  nfdId=/tmp-identity/R9D5K0Cq/KEY/ksk-1486454145570/ID-CERT
  version=0.5.1
  startTime=20170208T083410.833000
  currentTime=20170208T095430.001000
  uptime=4819 seconds
  nNameTreeEntries=21
  nFibEntries=4
  nPitEntries=7
  nMeasurementsEntries=0
  nCsEntries=26
  nInInterests=938
  nOutInterests=938
  nInDatAs=853
  nOutDatAs=849
  nInNacks=0
  nOutNacks=0
Channels:
  tcp4://0.0.0.0:6363
  tcp6://[::]:6363
  udp4://0.0.0.0:6363
  udp6://[::]:6363
  unix:///private/tmp/nfd.sock
  ws://[::]:9696
Faces:
  faceId=1 remote=internal:// local=internal:// counters={in={0i 845d 0n 4143368} out={925i 0d 0n 659408}} local permanent point-to-point flags={local-fields}
```

# Managing identity & certificate

- Each NDN application has an identity (namespace) and the corresponding certificate for this namespace
- Application also manages sub-identities and their certificates for highly granular security
- NDN Control Center integrates NDNCERT to enables automatic certificate management



# Conclusions

- NDN-CC: Bring NDN, NFD and related tools to your desktop system without installing each one separately
- Ease NDN usage, especially if you don't like command-line tools
- We will keep updating with latest ndn-cxx, NFD and NDN tools & will support other OS
- Download and try NDN Control Center: <https://named-data.net/codebase/applications/ndn-control-center/>

See you at the NDN CC demo later today!

Join our hackathon group to improve it!



