

CURRENT

RESEARCH

ON

INFORMATION

PROTECTION



# WHY IS IT "HOT" ?

- GOV'T DATA BANKS  
↓  
CONSUMER INTEREST
- IBM SAID SO
- MILITARY IS WORRIED
- EQUITY FUNDING (?)

INTEREST



\$



22 "Big" Projects

13 "Little" Projects

~ 100 Professionals

# "BIG" PROJECTS:

CARNEGIE	IBM RESEARCH
CAMBRIDGE	SYSTEM DEVELOPMENT CORP.
LAWRENCE R.L.	AIR FORCE ESD
ISI (USC)	MITRE
SRI	RAND
CASE	RUTGERS
Oberpfaffenhofen	TRW SYSTEMS
U. of C., BERKELEY	NBS
CORNELL	HISI
IBM / R. S. S.	MIT PROJECT MAC
UCLA	U. of HAWAII

WHAT ARE ALL THESE  
PEOPLE DOING?

3 ASPECTS:

- ISOLATION

SIMPLE GOAL, BUT WANT  
PERFECTION

- ACCESS CONTROL

WHAT SEMANTICS?

SIMPLIFY INTERFACES

- "ADVANCED" IDEAS

EXTENDIBLE TYPES

MUTUAL SUSPICION

# RESEARCH PROBLEMS

## 1. ARCHITECTURAL

CAPABILITY

VS.

ACCESS-CONTROL-LIST

## 2. INTERFACE

REDUCING COMPLEXITY

## 3. IMPLEMENTATION

PROVING CORRECTNESS

## 4. NETWORK

END-TO-END ENCRYPTION

# MAJOR CURRENT PROJECTS

## 1. ARCHITECTURAL

CMU: HYDRA

CAPABILITIES  
TYPE EXTENSION  
PROVABLE

CAMBRIDGE: CAP

CAPABILITIES  
USER INTERFACE

BERKELEY: PRIME

SUPER RELIABLE  
DOUBLE CHECK  
ON PROTECTION

# GET THE SIMPLE PARTITIONS PERFECT

AF/ESD

MODEL THE GOV'T  
SECURITY SYSTEM

MITRE

SECURE A POP-11/45  
OP SYSTEM

UCLA

MODEL VIRTUAL MACHINES

SRI

DIJKSTRA AT  
13 LEVELS

ISI

PROVE PARALLEL  
PROGRAMS CORRECT

CASE

MODEL A FILE SYSTEM

HISI

SECURE MULTICS

M.I.T.

SIMPLIFY MULTICS



# GET THE SIMPLE PARTITIONS PERFECT



MODEL THE GOV'T  
SECURITY SYSTEM

SECURE A POP-11/45  
OP SYSTEM

MODEL VIRTUAL MACHINES

DIJKSTRA AT  
13 LEVELS

PROVE PARALLEL  
PROGRAMS CORRECT

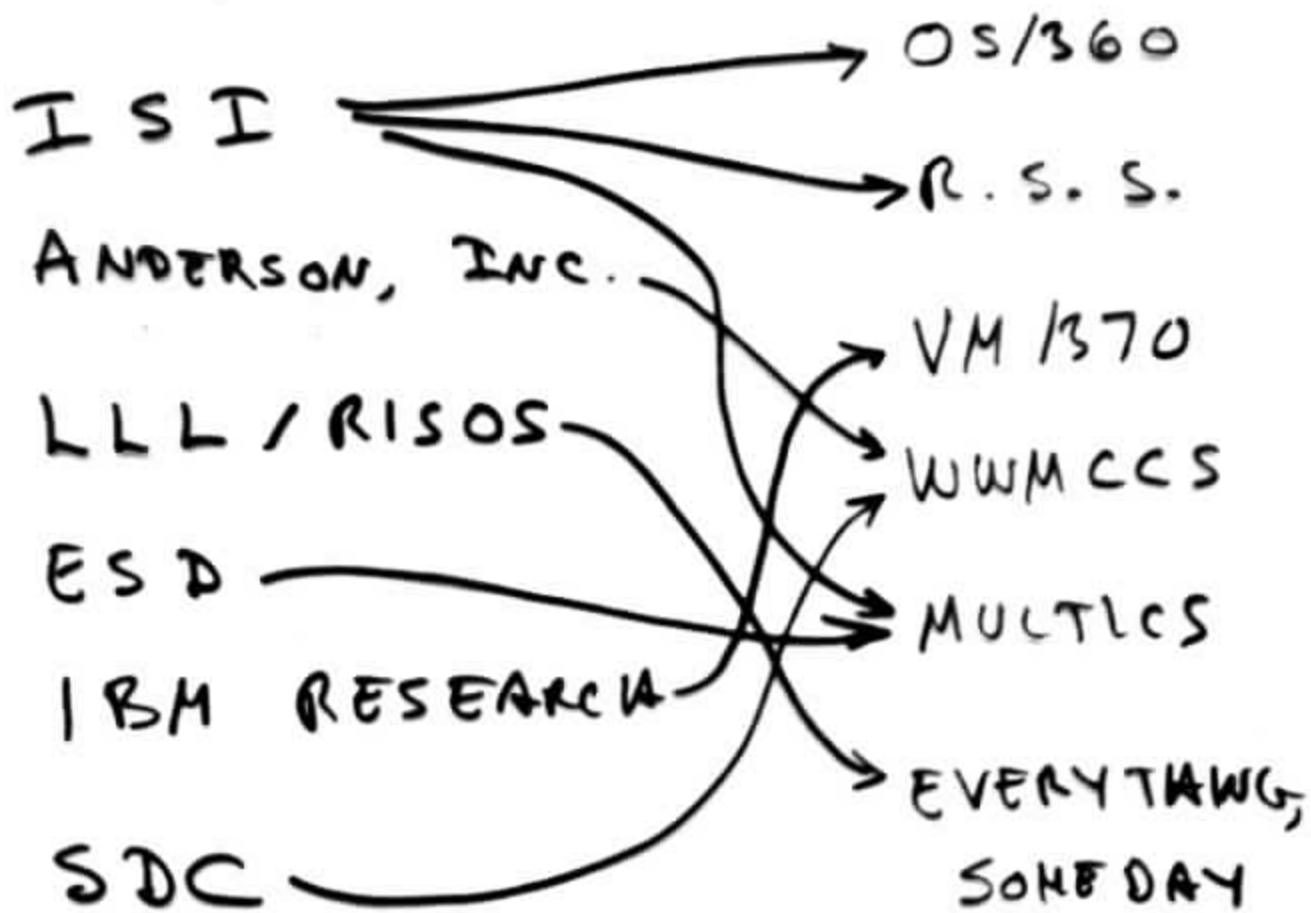
MODEL A FILE SYSTEM

SECURE MULTICS

SIMPLIFY MULTICS



# TIGER TEAMS



## RESULTS

1. CASE STUDIES (SECRET)
2. PATTERNS

## OTHER WORK

- SRI: CASE STUDIES OF COMPUTER-BASED ANTI-SOCIAL ACTS
- BERKELEY: SECURITY COSTS
- CORNELL: DATABASE CONTROLS (SEMANTICS)
- IBM RESEARCH: ENCRYPTION
- IBM SDD: USER REACTION TO SECURITY
- RAND: INFORMATION THEORETIC ASPECTS
- HISI: SECURE I/O, NETWORKS
- OHIO STATE: DATABASE CONTROLS
- HAWAII: SECURING ILLIAC IV

FURTHER INFORMATION

"ONGOING RESEARCH AND  
DEVELOPMENT ON  
INFORMATION PROTECTION";

ACM OPERATING SYSTEMS

REVIEW [SIGOPS QUARTERLY],

JULY, 1974