



“Scripting Language”, My Shiny Metal Arse



shtoom





voice over IP, in python





WARNING: talk may contain rant





and occasional cheap shots





what's VoIP?





telephony over the internet





why is VoIP interesting?





cheap calls





use IP network for voice as well
as data




take the telephone network away
from the telcos





... it's not like they're doing much
with it





enable the next round of cool
voice applications



VoIP clients





hardware phones





software phones





gateways





VoIP protocols





a short and biased summary





first, there was H.323






it sucks





a lot



don't let telcos design internet
protocols



this goes double for the ITU





from cheapshot import X.400, X.500





SIP





IETF does telephony





SIP is complex
(the S isn't for Simple)






the problem is complex





fortunately, we don't need all of it





UDP based, client-server
(or client-server-client-server)



SIP is just for control





setup, negotiation, call control



RTP





a little lump of audio in each UDP
packet





every 20ms



multiple audio formats





or video





RTP is just the transport





SIP+RTP = phone





other protocols





standards will win





even if they're not all that good



shtoom





why on earth did I attempt this?



a scriptable phone





make my H.323 pain go away



from cheapshot import c++





hopefully help stamp out
ignorance






“it's just a scripting language”



“only suitable for prototyping”



existing software phones not so
good



so write a better one





other voice applications






(voice applications <> voice
recognition)



why choose python?





hopefully you all know the
answers to that one



a few additional reasons





twisted





nice UI toolkit





many of them





so why not use python?





performance





it's just a scripting language, after
all





timing and performance





timing?



DIVMOD



an audio packet, every 20ms



but PC clocks run at 100Hz





miss by a fraction -> 10ms delay



this is very noticeable





approaches to timing





approach #1: setitimer





approach #2: reset the timer




approach #2b: cheat





approach #3: LoopingCall





LoopingCall works, and works
well



performance?



DIVMOD



audio processing





audio mixing





a pile of mathematics





raw python





psyco





numeric



DIVMOD



pyrex





reimplement the performance
critical bits



duh...



DIVMOD




audioop





use the standard library





the best optimization is one that
someone else already wrote

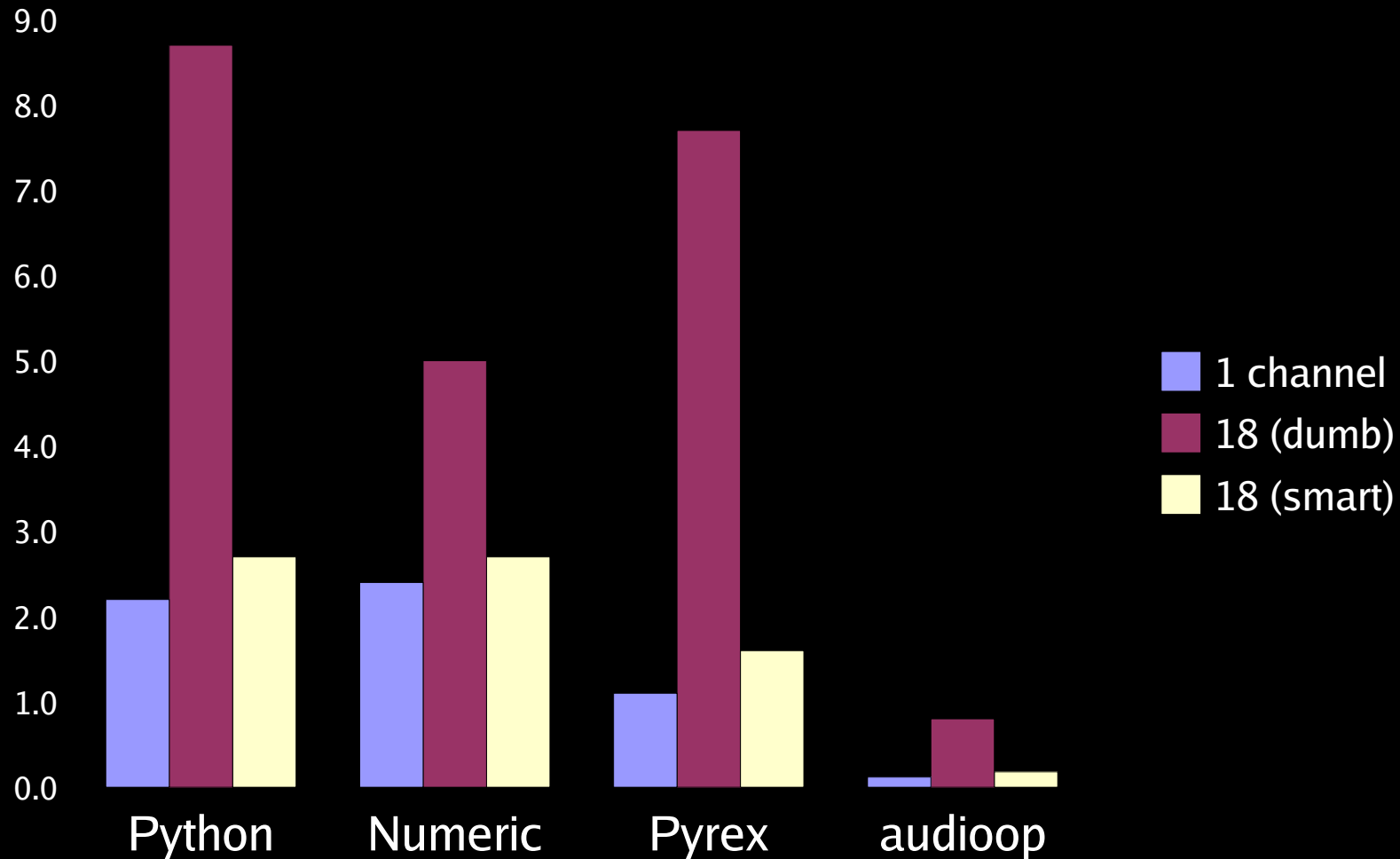


and the winner is...

	1 channel	18 channels (dumb)	18 channels (smart)
Python	2.2	8.7	2.7
Numeric	2.4	5	2.7
Pyrex	1.1	7.7	1.6
audioop	0.12	0.8	0.18




and again, for the managers





but I prefer this one

	1 channel	18 channels (dumb)	18 channels (smart)
Python	2.2	8.7	2.7
Numeric	2.4	5	2.7
Pyrex	1.1	7.7	1.6
audioop	0.12	0.8	0.18



“scripting language”, my arse



is this fast enough?

	1 channel	18 channels (dumb)	18 channels (smart)
Python	2.2	8.7	2.7
Numeric	2.4	5	2.7
Pyrex	1.1	7.7	1.6
audioop	0.12	0.8	0.18



audio encoding





other people have done this
already





so use their work





ULAW, GSM 06.10, G.72x, speex





wrapping C code is easy





yay (again) for Pyrex





shtoom today





second major release





cross-platform





kde/qt, gnome/gtk, tk, cocoa
(soon), wx (soon), command-line



software phone usable





firewall discovery and traversal



(an aside: UPnP)





from cheapshot import Microsoft





other applications






doug, the application server





conclusions



python isn't just “a scripting
language”



python is fun





VoIP is very cool right now





VoIP in python is cool





therefore, python is cool







no, really



DIVMOD



read the paper





use the phone





shtoom





questions, abuse, anyone I forgot
to insult?

